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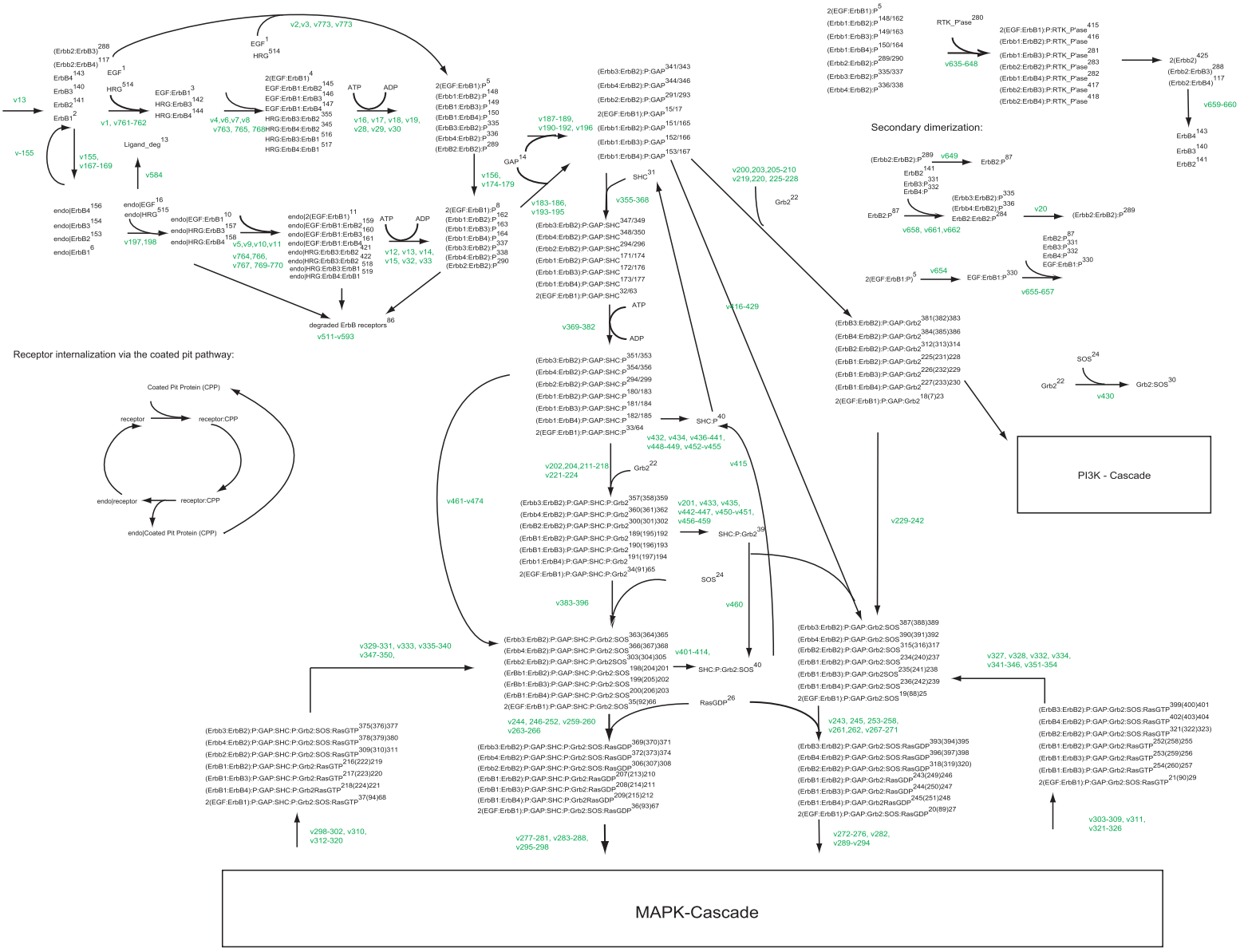
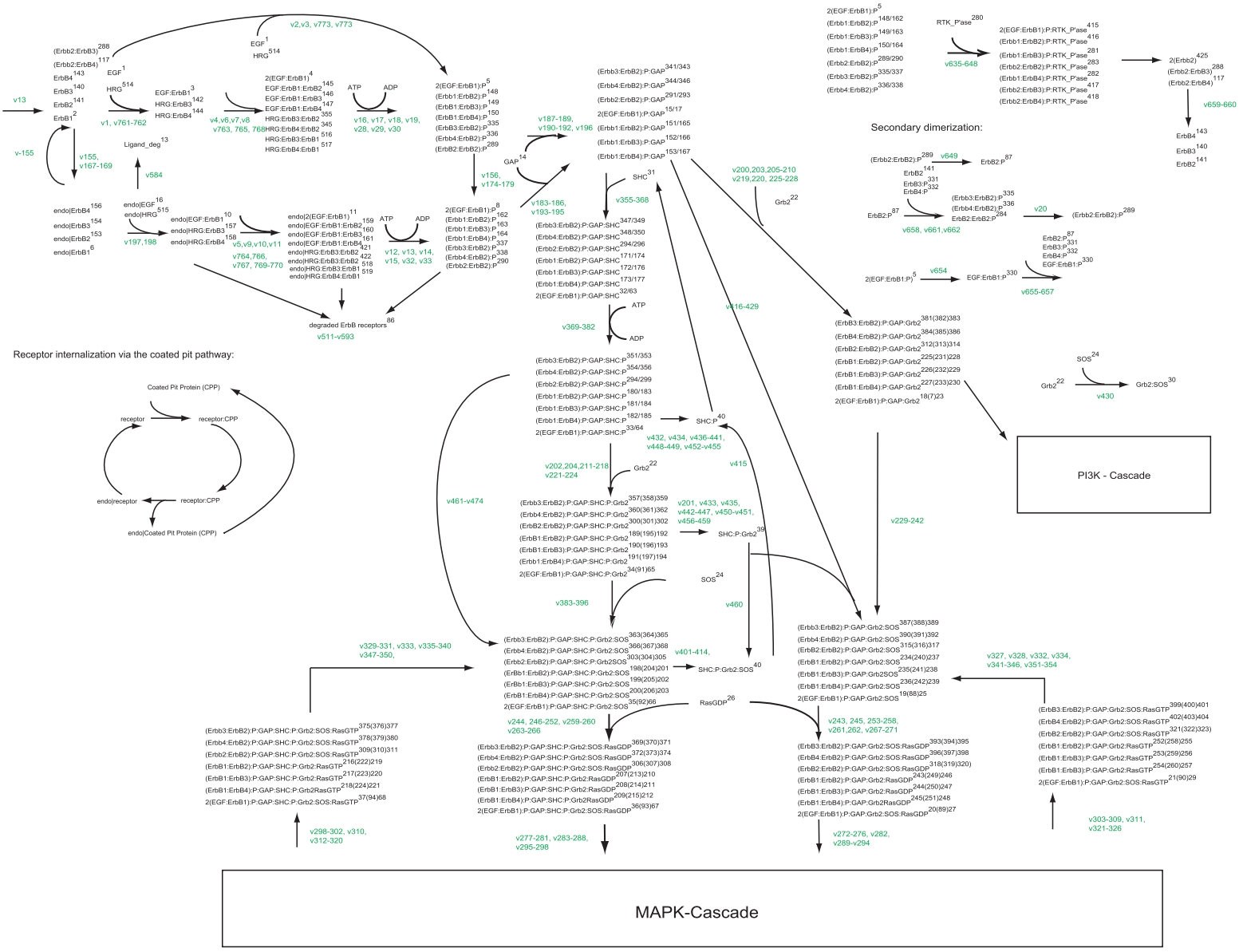
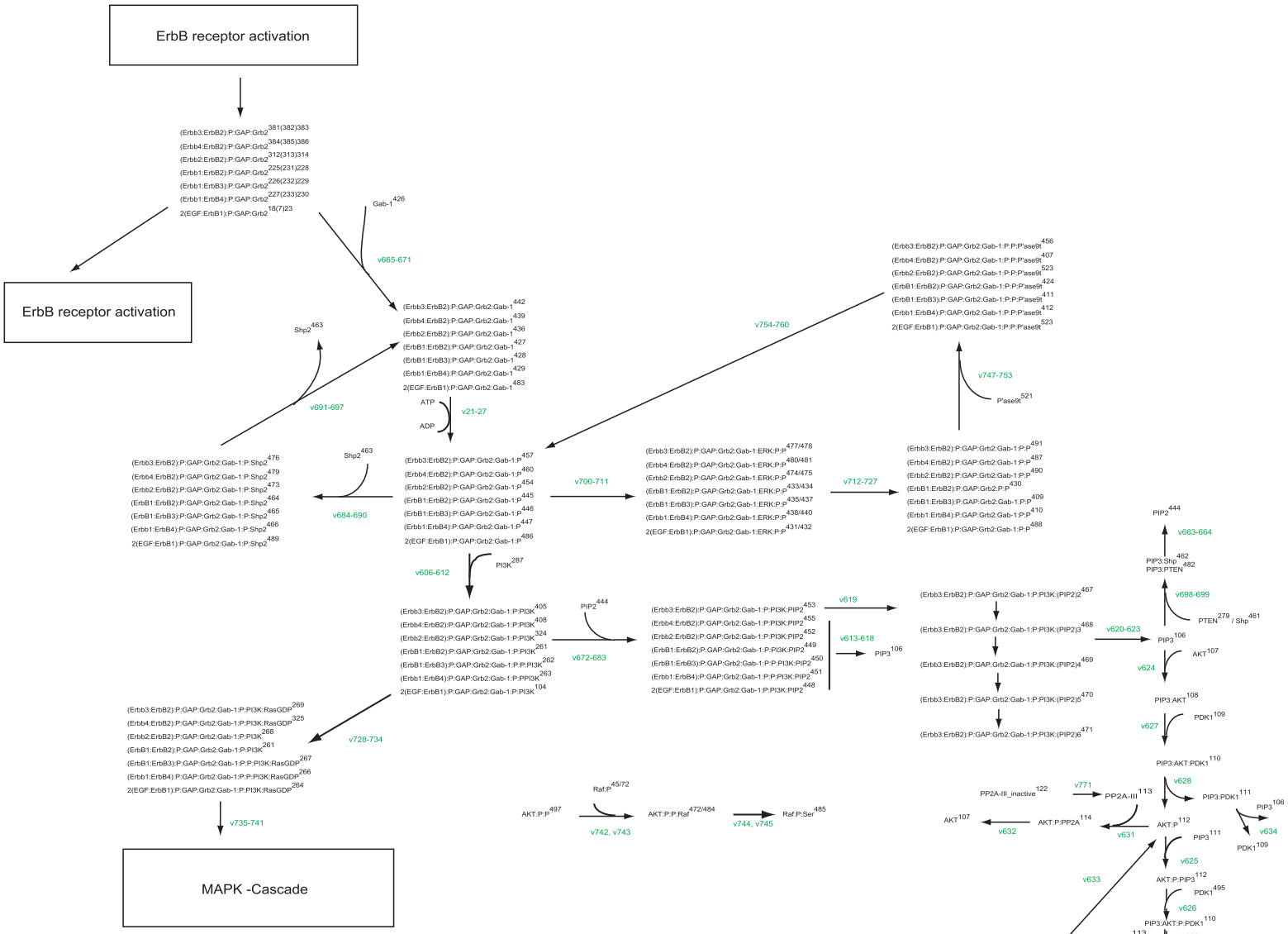


SFigure 1A. Expanded and detailed schematic of ErbB model receptor layer.



SFigure 1B. Expanded and detailed schematic of ErbB model PI3K pathway.



SFigure 1C. Expanded and detailed schematic of ErbB model MAPK pathway.

SFigure 2. Differential equations, initial conditions, and parameter values for the ErbB model. (A) List of differential equations of ErbB model. The left-hand side of an equation is the time derivative of the number of molecules of a species. The right-hand side is a collection of first or second order reaction terms between species that contribute to the generation or degradation of the species on the left-hand side. (B) List of species, their corresponding variable names and initial number of molecules. (C) List of parameters in the differential equations, and their corresponding values.

A

(1) $\dot{x}_1 = -k_1 \cdot x_1 \cdot x_2 + k_{-1} \cdot x_3 - k_{1c} \cdot x_{288} \cdot x_1 + k_{-1c} \cdot x_{335} - k_{1-} \cdot x_{117} \cdot x_1 + k_{-1-} \cdot x_{336} - k_1 \cdot x_1 \cdot x_{286} + k_{-1} \cdot x_{499} - k_1 \cdot x_1 \cdot x_{525} + k_{-1} \cdot x_{526} - k_1 \cdot x_1 \cdot x_{524} + k_{-1} \cdot x_{529} - k_6 \cdot x_1 + k_{-6} \cdot x_{524}$
(2) $\dot{x}_2 = -k_1 \cdot x_1 \cdot x_2 + k_{-1} \cdot x_3 - k_{120b} \cdot x_{142} \cdot x_2 + k_{-120} \cdot x_{516} - k_{120b} \cdot x_{144} \cdot x_2 + k_{-120} \cdot x_{517} + k_{122} \cdot x_{531} \cdot x_{105} - k_{-122} \cdot x_2$
(3) $\dot{x}_3 = +k_1 \cdot x_1 \cdot x_2 - k_{-1} \cdot x_3 - k_2 \cdot x_3 \cdot x_{499} + k_{-2} \cdot x_{500} - k_2 \cdot x_3 \cdot x_3 + k_{-2} \cdot x_4 - k_2 \cdot x_3 \cdot x_3 + k_{-2} \cdot x_4 - k_{2b} \cdot x_3 \cdot x_{141} + k_{-2b} \cdot x_{145} - k_{2b} \cdot x_3 \cdot x_{140} + k_{-2b} \cdot x_{146} - k_{2b} \cdot x_{143} \cdot x_3 + k_{-2b} \cdot x_{147} - k_{2b} \cdot x_3 \cdot x_{502} + k_{-2b} \cdot x_{504} - k_{2b} \cdot x_3 \cdot x_{503} + k_{-2b} \cdot x_{505} - k_{2b} \cdot x_3 \cdot x_{506} + k_{-2b} \cdot x_{507} - k_2 \cdot x_3 \cdot x_{526} + k_{-2} \cdot x_{527} - k_2 \cdot x_3 \cdot x_{529} + k_{-2} \cdot x_{534}$
(4) $\dot{x}_4 = +k_2 \cdot x_3 \cdot x_3 - k_{-2} \cdot x_4$
(5) $\dot{x}_5 = -k_8 \cdot x_5 \cdot x_{14} + k_{-8} \cdot x_{15} + k_{102} \cdot x_{330} \cdot x_{330} - k_{-102} \cdot x_5$
(6) $\dot{x}_6 = -k_{10b} \cdot x_6 \cdot x_{16} + k_{-10} \cdot x_{10} - k_{120b} \cdot x_6 \cdot x_{157} + k_{-120} \cdot x_{518} - k_{120b} \cdot x_6 \cdot x_{158} + k_{-120} \cdot x_{519}$
(7) $\dot{x}_7 = +k_4 \cdot x_{23} \cdot x_{12} - k_{-4} \cdot x_7 + k_5 \cdot x_{18} \cdot x_9 - k_{-5} \cdot x_7$
(8) $\dot{x}_8 = -k_8 \cdot x_8 \cdot x_{14} + k_{-8} \cdot x_{17} - k_{94} \cdot x_{280} \cdot x_8 + k_{-94} \cdot x_{415}$
(9) $\dot{x}_9 = -k_{5b} \cdot x_9 \cdot x_{404} + k_{-5b} \cdot x_{403} - k_{5b} \cdot x_9 \cdot x_{401} + k_{-5b} \cdot x_{400} - k_{5b} \cdot x_9 \cdot x_{398} + k_{-5b} \cdot x_{397} - k_{5b} \cdot x_9 \cdot x_{395} + k_{-5b} \cdot x_{394} - k_{5b} \cdot x_9 \cdot x_{392} + k_{-5b} \cdot x_{391} - k_{5b} \cdot x_9 \cdot x_{389} + k_{-5b} \cdot x_{388} - k_{5b} \cdot x_9 \cdot x_{386} + k_{-5b} \cdot x_{385} - k_{5b} \cdot x_9 \cdot x_{365} + k_{-5b} \cdot x_{364} - k_{5b} \cdot x_9 \cdot x_{383} + k_{-5b} \cdot x_{382} - k_{5b} \cdot x_9 \cdot x_{380} + k_{-5b} \cdot x_{379} - k_{5b} \cdot x_9 \cdot x_{377} + k_{-5b} \cdot x_{376} - k_{5b} \cdot x_9 \cdot x_{374} + k_{-5b} \cdot x_{373} - k_{5b} \cdot x_9 \cdot x_{371} + k_{-5b} \cdot x_{370} - k_{5b} \cdot x_9 \cdot x_{368} + k_{-5b} \cdot x_{367} - k_{5b} \cdot x_9 \cdot x_{362} + k_{-5b} \cdot x_{361} - k_{5b} \cdot x_9 \cdot x_{359} + k_{-5b} \cdot x_{358} - k_5 \cdot x_9 \cdot x_{323} + k_{-5b} \cdot x_{322} - k_5 \cdot x_9 \cdot x_{320} + k_{-5b} \cdot x_{319} - k_5 \cdot x_9 \cdot x_{317} + k_{-5b} \cdot x_{316} - k_5 \cdot x_9 \cdot x_{314} + k_{-5b} \cdot x_{313} - k_5 \cdot x_9 \cdot x_{311} + k_{-5b} \cdot x_{310} - k_5 \cdot x_9 \cdot x_{308} + k_{-5b} \cdot x_{307} - k_5 \cdot x_9 \cdot x_{305} + k_{-5b} \cdot x_{304} - k_5 \cdot x_9 \cdot x_{302} + k_{-5b} \cdot x_{301} - k_5 \cdot x_9 \cdot x_{239} + k_{-5b} \cdot x_{242} - k_5 \cdot x_9 \cdot x_{238} + k_{-5b} \cdot x_{241} - k_5 \cdot x_9 \cdot x_{237} + k_{-5b} \cdot x_{240} - k_5 \cdot x_9 \cdot x_{257} + k_{-5b} \cdot x_{260} - k_5 \cdot x_9 \cdot x_{256} + k_{-5b} \cdot x_{259} - k_5 \cdot x_9 \cdot x_{255} + k_{-5b} \cdot x_{258} - k_5 \cdot x_9 \cdot x_{248} + k_{-5b} \cdot x_{251} - k_5 \cdot x_9 \cdot x_{247} + k_{-5b} \cdot x_{250} - k_5 \cdot x_9 \cdot x_{246} + k_{-5b} \cdot x_{249} - k_5 \cdot x_9 \cdot x_{230} + k_{-5b} \cdot x_{233} - k_5 \cdot x_9 \cdot x_{229} + k_{-5b} \cdot x_{232} - k_5 \cdot x_9 \cdot x_{228} + k_{-5b} \cdot x_{231} - k_5 \cdot x_9 \cdot x_{221} + k_{-5b} \cdot x_{224} - k_5 \cdot x_9 \cdot x_{220} + k_{-5b} \cdot x_{223} - k_5 \cdot x_9 \cdot x_{219} + k_{-5b} \cdot x_{222} - k_5 \cdot x_9 \cdot x_{212} + k_{-5b} \cdot x_{215} - k_5 \cdot x_9 \cdot x_{211} + k_{-5b} \cdot x_{214} - k_5 \cdot x_9 \cdot x_{210} + k_{-5b} \cdot x_{213} - k_5 \cdot x_9 \cdot x_{203} + k_{-5b} \cdot x_{206} - k_5 \cdot x_9 \cdot x_{202} + k_{-5b} \cdot x_{205} - k_5 \cdot x_9 \cdot x_{201} + k_{-5b} \cdot x_{204} - k_5 \cdot x_9 \cdot x_{194} + k_{-5b} \cdot x_{197} - k_5 \cdot x_9 \cdot x_{193} + k_{-5b} \cdot x_{196} - k_5 \cdot x_9 \cdot x_{192} + k_{-5b} \cdot x_{195} - k_5 \cdot x_{68} \cdot x_9 + k_{-5} \cdot x_{94} - k_5 \cdot x_9 \cdot x_{67} + k_{-5} \cdot x_{93} - k_5 \cdot x_9 \cdot x_{66} + k_{-5} \cdot x_{92} - k_5 \cdot x_9 \cdot x_{65} + k_{-5} \cdot x_{91} - k_5 \cdot x_9 \cdot x_{21} + k_{-5} \cdot x_{90} - k_5 \cdot x_9 \cdot x_{20} + k_{-5} \cdot x_{89} - k_5 \cdot x_{18} \cdot x_9 + k_{-5} \cdot x_7 - k_5 \cdot x_9 \cdot x_{19} + k_{-5} \cdot x_{88} - k_6 \cdot x_9 + k_{-6} \cdot x_{19} - k_6 \cdot x_9 + k_{-6} \cdot x_{19} - k_6 \cdot x_9 + k_{-6} \cdot x_{19} - k_6 \cdot x_9 + k_{-6} \cdot x_{19} - k_6 \cdot x_9 + k_{-6} \cdot x_{19} - k_6 \cdot x_9 + k_{-6} \cdot x_{19} - k_6 \cdot x_9 + k_{-6} \cdot x_{19} - k_6 \cdot x_9 + k_{-6} \cdot x_{19} - k_6 \cdot x_9 + k_{-6} \cdot x_{19} - k_6 \cdot x_9 + k_{-6} \cdot x_{19} - k_6 \cdot x_9 + k_{-6} \cdot x_{19} - k_{6b} \cdot x_9 + k_{-6b} \cdot x_{19} - k_{6b} \cdot x_9 + k_{-6b} \cdot x_{19} - k_{6b} \cdot x_9 + k_{-6b} \cdot x_{19} - k_{6b} \cdot x_9 + k_{-6b} \cdot x_{19} - k_6 \cdot x_9 + k_{-6} \cdot x_{19} - k_{6b} \cdot x_9 + k_{-6b} \cdot x_{19} - k_{6b} \cdot x_9 + k_{-6b} \cdot x_{19} - k_{6b} \cdot x_9 + k_{-6b} \cdot x_{19} - k_{6b} \cdot x_9 + k_{-6b} \cdot x_{19} - k_7 \cdot x_9 + k_{-7} \cdot x_{19} - k_7 \cdot x_9 + k_{-7} \cdot x_{19} - k_7 \cdot x_9 + k_{-7} \cdot x_{19} - k_7 \cdot x_9 + k_{-7} \cdot x_{19} - k_7 \cdot x_9 + k_{-7} \cdot x_{19} - k_7 \cdot x_9 + k_{-7} \cdot x_{19} - k_7 \cdot x_9 + k_{-7} \cdot x_{19} - k_7 \cdot x_9 + k_{-7} \cdot x_{19} - k_7 \cdot x_9 + k_{-7} \cdot x_{19} - k_7 \cdot x_9 + k_{-7} \cdot x_{19} - k_7 \cdot x_9 + k_{-7} \cdot x_{19}$
(10) $\dot{x}_{10} = -k_2 \cdot x_{10} \cdot x_{10} + k_{-2} \cdot x_{11} - k_2 \cdot x_{10} \cdot x_{10} + k_{-2} \cdot x_{11} - k_{2b} \cdot x_{10} \cdot x_{155} + k_{-2b} \cdot x_{159} - k_{2b} \cdot x_{10} \cdot x_{154} + k_{-2b} \cdot x_{160} - k_{2b} \cdot x_{10} \cdot x_{156} + k_{-2b} \cdot x_{161} + k_{10b} \cdot x_6 \cdot x_{16} - k_{-10} \cdot x_{10} + k_{10b} \cdot x_{530} \cdot x_{16} - k_{-10} \cdot x_{10}$
(11) $\dot{x}_{11} = +k_2 \cdot x_{10} \cdot x_{10} - k_{-2} \cdot x_{11} - k_{95} \cdot x_{280} \cdot x_{11} + k_{-95} \cdot x_{415}$
(12) $\dot{x}_{12} = -k_4 \cdot x_{23} \cdot x_{12} + k_{-4} \cdot x_7 - k_4 \cdot x_{25} \cdot x_{12} + k_{-4} \cdot x_{88} - k_4 \cdot x_{27} \cdot x_{12} + k_{-4} \cdot x_{89} - k_4 \cdot x_{29} \cdot x_{12} + k_{-4} \cdot x_{90} - k_4 \cdot x_{34} \cdot x_{12} + k_{-4} \cdot x_{91} - k_4 \cdot x_{35} \cdot x_{12} + k_{-4} \cdot x_{92} - k_4 \cdot x_{36} \cdot x_{12} + k_{-4} \cdot x_{93} - k_4 \cdot x_{37} \cdot x_{12} + k_{-4} \cdot x_{94} - k_{4b} \cdot x_{189} \cdot x_{12} + k_{-4} \cdot x_{195} - k_{4b} \cdot x_{190} \cdot x_{12} + k_{-4} \cdot x_{196} - k_{4b} \cdot x_{191} \cdot x_{12} + k_{-4} \cdot x_{197} - k_{4b} \cdot x_{198} \cdot x_{12} + k_{-4} \cdot x_{204} - k_{4b} \cdot x_{199} \cdot x_{12} + k_{-4} \cdot x_{205} - k_{4b} \cdot x_{200} \cdot x_{12} + k_{-4} \cdot x_{206} - k_{4b} \cdot x_{207} \cdot x_{12} + k_{-4} \cdot x_{213} - k_{4b} \cdot x_{208} \cdot x_{12} + k_{-4} \cdot x_{214} - k_{4b} \cdot x_{209} \cdot x_{12} + k_{-4} \cdot x_{215} - k_{4b} \cdot x_{216} \cdot x_{12} + k_{-4} \cdot x_{222} - k_{4b} \cdot x_{217} \cdot x_{12} + k_{-4} \cdot x_{223} - k_{4b} \cdot x_{218} \cdot x_{12} + k_{-4} \cdot x_{224} - k_{4b} \cdot x_{225} \cdot x_{12} + k_{-4} \cdot x_{231} - k_{4b} \cdot x_{226} \cdot x_{12} + k_{-4} \cdot x_{232} - k_{4b} \cdot x_{227} \cdot x_{12} + k_{-4} \cdot x_{233} - k_{4b} \cdot x_{243} \cdot x_{12} + k_{-4} \cdot x_{249} - k_{4b} \cdot x_{244} \cdot x_{12} + k_{-4} \cdot x_{250} - k_{4b} \cdot x_{245} \cdot x_{12} + k_{-4} \cdot x_{251} - k_4 \cdot x_{252} \cdot x_{12} + k_{-4} \cdot x_{258} - k_4 \cdot x_{253} \cdot x_{12} + k_{-4} \cdot x_{259} - k_4 \cdot x_{254} \cdot x_{12} + k_{-4} \cdot x_{260} - k_{4b} \cdot x_{234} \cdot x_{12} + k_{-4} \cdot x_{240} - k_{4b} \cdot x_{235} \cdot x_{12} + k_{-4} \cdot x_{241} - k_{4b} \cdot x_{236} \cdot x_{12} + k_{-4} \cdot x_{242} - k_{4b} \cdot x_{300} \cdot x_{12} + k_{-4} \cdot x_{301} - k_{4b} \cdot x_{303} \cdot x_{12} + k_{-4} \cdot x_{304} - k_{4b} \cdot x_{306} \cdot x_{12} + k_{-4} \cdot x_{307} - k_{4b} \cdot x_{309} \cdot x_{12} + k_{-4} \cdot x_{310} -$

$k_{4b} \cdot x_{312} \cdot x_{12} + k_{-4} \cdot x_{313} - k_{4b} \cdot x_{315} \cdot x_{12} + k_{-4} \cdot x_{316} - k_{4b} \cdot x_{318} \cdot x_{12} + k_{-4} \cdot x_{319} - k_{4b} \cdot x_{321} \cdot x_{12} + k_{-4} \cdot x_{322} - k_{4b} \cdot x_{357} \cdot x_{12} + k_{-4} \cdot x_{358} - k_{4b} \cdot x_{360} \cdot x_{12} + k_{-4} \cdot x_{361} - k_{4b} \cdot x_{366} \cdot x_{12} + k_{-4} \cdot x_{367} - k_{4b} \cdot x_{369} \cdot x_{12} + k_{-4} \cdot x_{370} - k_{4b} \cdot x_{372} \cdot x_{12} + k_{-4} \cdot x_{373} - k_{4b} \cdot x_{375} \cdot x_{12} + k_{-4} \cdot x_{376} - k_{4b} \cdot x_{378} \cdot x_{12} + k_{-4} \cdot x_{379} - k_{4b} \cdot x_{381} \cdot x_{12} + k_{-4} \cdot x_{382} - k_{4b} \cdot x_{363} \cdot x_{12} + k_{-4} \cdot x_{364} - k_{4b} \cdot x_{384} \cdot x_{12} + k_{-4} \cdot x_{385} - k_{4b} \cdot x_{387} \cdot x_{12} + k_{-4} \cdot x_{388} - k_{4b} \cdot x_{390} \cdot x_{12} + k_{-4} \cdot x_{391} - k_{4b} \cdot x_{393} \cdot x_{12} + k_{-4} \cdot x_{394} - k_{4b} \cdot x_{396} \cdot x_{12} + k_{-4} \cdot x_{397} - k_{4b} \cdot x_{399} \cdot x_{12} + k_{-4} \cdot x_{400} - k_{4b} \cdot x_{402} \cdot x_{12} + k_{-4} \cdot x_{403}$

(13) $\dot{x}_{14} = -k_{8b} \cdot x_{162} \cdot x_{14} + k_{-8b} \cdot x_{165} - k_{8b} \cdot x_{163} \cdot x_{14} + k_{-8b} \cdot x_{166} - k_{8b} \cdot x_{164} \cdot x_{14} + k_{-8b} \cdot x_{167} - k_8 \cdot x_8 \cdot x_{14} + k_{-8} \cdot x_{17} - k_8 \cdot x_5 \cdot x_{14} + k_{-8} \cdot x_{15} - k_8 \cdot x_{148} \cdot x_{14} + k_{-8} \cdot x_{151} - k_{8b} \cdot x_{149} \cdot x_{14} + k_{-8b} \cdot x_{152} - k_{8b} \cdot x_{150} \cdot x_{14} + k_{-8b} \cdot x_{153} - k_8 \cdot x_{14} \cdot x_{335} + k_{-8} \cdot x_{341} - k_8 \cdot x_{14} \cdot x_{336} + k_{-8} \cdot x_{344} - k_8 \cdot x_{14} \cdot x_{337} + k_{-8} \cdot x_{343} - k_8 \cdot x_{14} \cdot x_{338} + k_{-8} \cdot x_{346} - k_8 \cdot x_{290} \cdot x_{14} + k_{-8} \cdot x_{293} - k_8 \cdot x_{289} \cdot x_{14} + k_{-8} \cdot x_{291}$

(14) $\dot{x}_{15} = +k_8 \cdot x_5 \cdot x_{14} - k_{-8} \cdot x_{15} - k_{16} \cdot x_{22} \cdot x_{15} + k_{-63} \cdot x_{23} - k_{22} \cdot x_{31} \cdot x_{15} + k_{-22} \cdot x_{32} - k_{32} \cdot x_{15} \cdot x_{38} + k_{-32} \cdot x_{35} - k_{34} \cdot x_{15} \cdot x_{30} + k_{-34} \cdot x_{25} - k_{37} \cdot x_{15} \cdot x_{40} + k_{-37} \cdot x_{33} - k_{37} \cdot x_{15} \cdot x_{39} + k_{-37} \cdot x_{34}$

(15) $\dot{x}_{16} = -k_{10b} \cdot x_6 \cdot x_{16} + k_{-10} \cdot x_{10} - k_{10b} \cdot x_{530} \cdot x_{16} + k_{-10} \cdot x_{10}$

(16) $\dot{x}_{17} = +k_8 \cdot x_8 \cdot x_{14} - k_{-8} \cdot x_{17} - k_{16} \cdot x_{17} \cdot x_{22} + k_{-63} \cdot x_{18} - k_{22} \cdot x_{31} \cdot x_{17} + k_{-22} \cdot x_{63} - k_{32} \cdot x_{17} \cdot x_{38} + k_{-32} \cdot x_{66} - k_{34} \cdot x_{17} \cdot x_{30} + k_{-34} \cdot x_{19} - k_{37} \cdot x_{17} \cdot x_{40} + k_{-37} \cdot x_{64} - k_{37} \cdot x_{17} \cdot x_{39} + k_{-37} \cdot x_{65}$

(17) $\dot{x}_{18} = -k_5 \cdot x_{18} \cdot x_9 + k_{-5} \cdot x_7 + k_{16} \cdot x_{17} \cdot x_{22} - k_{-63} \cdot x_{18} - k_{17} \cdot x_{24} \cdot x_{18} + k_{-17} \cdot x_{19} - k_{101} \cdot x_{103} \cdot x_{18} + k_{-101} \cdot x_{100}$

(18) $\dot{x}_{19} = -k_5 \cdot x_9 \cdot x_{19} + k_{-5} \cdot x_{88} + k_6 \cdot x_9 - k_{-6} \cdot x_{19} + k_6 \cdot x_9 - k_{-6} \cdot x_{19} + k_6 \cdot x_9 - k_{-6} \cdot x_{19} + k_6 \cdot x_9 - k_{-6} \cdot x_{19} + k_6 \cdot x_9 - k_{-6} \cdot x_{19} + k_6 \cdot x_9 - k_{-6} \cdot x_{19} + k_6 \cdot x_9 - k_{-6} \cdot x_{19} + k_6 \cdot x_9 - k_{-6} \cdot x_{19} + k_6 \cdot x_9 - k_{-6} \cdot x_{19} + k_6 \cdot x_9 - k_{-6} \cdot x_{19} + k_{6b} \cdot x_9 - k_{-6b} \cdot x_{19} + k_{6b} \cdot x_9 - k_{-6b} \cdot x_{19} + k_{6b} \cdot x_9 - k_{-6b} \cdot x_{19} + k_{6b} \cdot x_9 - k_{-6b} \cdot x_{19} + k_6 \cdot x_9 - k_{-6} \cdot x_{19} + k_{6b} \cdot x_9 - k_{-6b} \cdot x_{19} + k_{6b} \cdot x_9 - k_{-6b} \cdot x_{19} + k_{6b} \cdot x_9 - k_{-6b} \cdot x_{19} + k_{6b} \cdot x_9 - k_{-6b} \cdot x_{19} + k_7 \cdot x_9 - k_{-7} \cdot x_{19} + k_7 \cdot x_9 - k_{-7} \cdot x_{19} + k_7 \cdot x_9 - k_{-7} \cdot x_{19} + k_7 \cdot x_9 - k_{-7} \cdot x_{19} + k_7 \cdot x_9 - k_{-7} \cdot x_{19} + k_7 \cdot x_9 - k_{-7} \cdot x_{19} + k_7 \cdot x_9 - k_{-7} \cdot x_{19} + k_7 \cdot x_9 - k_{-7} \cdot x_{19} + k_{17} \cdot x_{24} \cdot x_{18} - k_{-17} \cdot x_{19} - k_{18} \cdot x_{26} \cdot x_{19} + k_{-18} \cdot x_{20} - k_{19} \cdot x_{69} \cdot x_{19} + k_{-19} \cdot x_{20} - k_{20} \cdot x_{71} \cdot x_{19} + k_{-20} \cdot x_{21} - k_{21} \cdot x_{19} \cdot x_{26} + k_{-21} \cdot x_{21} + k_{34} \cdot x_{17} \cdot x_{30} - k_{-34} \cdot x_{19} - k_{64} \cdot x_{83} \cdot x_{19} + k_{-64} \cdot x_{96}$

(19) $\dot{x}_{20} = -k_5 \cdot x_9 \cdot x_{20} + k_{-5} \cdot x_{89} + k_{18} \cdot x_{26} \cdot x_{19} - k_{-18} \cdot x_{20} + k_{19} \cdot x_{69} \cdot x_{19} - k_{-19} \cdot x_{20}$

(20) $\dot{x}_{21} = -k_5 \cdot x_9 \cdot x_{21} + k_{-5} \cdot x_{90} + k_{20} \cdot x_{71} \cdot x_{19} - k_{-20} \cdot x_{21} + k_{21} \cdot x_{19} \cdot x_{26} - k_{-21} \cdot x_{21}$

(21) $\dot{x}_{22} = -k_{16} \cdot x_{22} \cdot x_{15} + k_{-63} \cdot x_{23} - k_{16} \cdot x_{22} \cdot x_{40} + k_{-24} \cdot x_{39} - k_{16} \cdot x_{22} \cdot x_{33} + k_{-24} \cdot x_{34} - k_{16} \cdot x_{17} \cdot x_{22} + k_{-63} \cdot x_{18} - k_{16} \cdot x_{22} \cdot x_{64} + k_{-24} \cdot x_{65} - k_{16} \cdot x_{22} \cdot x_{151} + k_{-24} \cdot x_{225} - k_{16} \cdot x_{22} \cdot x_{152} + k_{-24} \cdot x_{226} - k_{16} \cdot x_{22} \cdot x_{153} + k_{-24} \cdot x_{227} - k_{16} \cdot x_{165} \cdot x_{22} + k_{-24} \cdot x_{228} - k_{16} \cdot x_{166} \cdot x_{22} + k_{-24} \cdot x_{229} - k_{16} \cdot x_{167} \cdot x_{22} + k_{-24} \cdot x_{230} - k_{16} \cdot x_{22} \cdot x_{180} + k_{-24} \cdot x_{189} - k_{16} \cdot x_{22} \cdot x_{181} + k_{-24} \cdot x_{190} - k_{16} \cdot x_{22} \cdot x_{182} + k_{-24} \cdot x_{191} - k_{16} \cdot x_{22} \cdot x_{183} + k_{-24} \cdot x_{192} - k_{16} \cdot x_{22} \cdot x_{184} + k_{-24} \cdot x_{193} - k_{16} \cdot x_{22} \cdot x_{185} + k_{-24} \cdot x_{194} - k_{16} \cdot x_{22} \cdot x_{297} + k_{-24} \cdot x_{300} - k_{16} \cdot x_{22} \cdot x_{299} + k_{-24} \cdot x_{302} - k_{16} \cdot x_{291} \cdot x_{22} + k_{-63} \cdot x_{312} - k_{16} \cdot x_{293} \cdot x_{22} + k_{-63} \cdot x_{314} - k_{16} \cdot x_{22} \cdot x_{351} + k_{-24} \cdot x_{357} - k_{16} \cdot x_{22} \cdot x_{353} + k_{-24} \cdot x_{359} - k_{16} \cdot x_{22} \cdot x_{354} + k_{-24} \cdot x_{360} - k_{16} \cdot x_{22} \cdot x_{356} + k_{-24} \cdot x_{362} - k_{16} \cdot x_{341} \cdot x_{22} + k_{-63} \cdot x_{381} - k_{16} \cdot x_{343} \cdot x_{22} + k_{-24} \cdot x_{383} - k_{16} \cdot x_{344} \cdot x_{22} + k_{-24} \cdot x_{384} - k_{16} \cdot x_{346} \cdot x_{22} + k_{-63} \cdot x_{386} - k_{35} \cdot x_{24} \cdot x_{22} + k_{-35} \cdot x_{30} + k_{36} \cdot x_{24} - k_{-36} \cdot x_{22}$

(22) $\dot{x}_{23} = -k_4 \cdot x_{23} \cdot x_{12} + k_{-4} \cdot x_7 + k_{16} \cdot x_{22} \cdot x_{15} - k_{-63} \cdot x_{23} - k_{17} \cdot x_{24} \cdot x_{23} + k_{-17} \cdot x_{25} - k_{101} \cdot x_{103} \cdot x_{23} + k_{-101} \cdot x_{99} - k_{105} \cdot x_{23} \cdot x_{426} + k_{-105} \cdot x_{483}$

(23) $\dot{x}_{24} = -k_{17} \cdot x_{24} \cdot x_{381} + k_{-17} \cdot x_{387} - k_{17} \cdot x_{24} \cdot x_{383} + k_{-17} \cdot x_{389} - k_{17} \cdot x_{24} \cdot x_{384} + k_{-17} \cdot x_{390} - k_{17} \cdot x_{24} \cdot x_{386} + k_{-17} \cdot x_{392} - k_{17} \cdot x_{24} \cdot x_{312} + k_{-17} \cdot x_{315} - k_{17} \cdot x_{24} \cdot x_{314} + k_{-17} \cdot x_{317} - k_{17} \cdot x_{24} \cdot x_{18} + k_{-17} \cdot x_{19} - k_{17} \cdot x_{24} \cdot x_{23} + k_{-17} \cdot x_{25} - k_{17} \cdot x_{24} \cdot x_{225} + k_{-17} \cdot x_{234} - k_{17} \cdot x_{24} \cdot x_{226} + k_{-17} \cdot x_{235} - k_{17} \cdot x_{24} \cdot x_{227} + k_{-17} \cdot x_{236} - k_{17} \cdot x_{24} \cdot x_{228} + k_{-17} \cdot x_{237} - k_{17} \cdot x_{24} \cdot x_{229} + k_{-17} \cdot x_{238} - k_{17} \cdot x_{24} \cdot x_{230} + k_{-17} \cdot x_{239} - k_{25} \cdot x_{24} \cdot x_{34} + k_{-25} \cdot x_{35} - k_{25} \cdot x_{24} \cdot x_{65} + k_{-25} \cdot x_{66} - k_{25} \cdot x_{24} \cdot x_{189} + k_{-25} \cdot x_{198} - k_{25} \cdot x_{24} \cdot x_{190} + k_{-25} \cdot x_{199} - k_{25} \cdot x_{24} \cdot x_{191} + k_{-25} \cdot x_{200} - k_{25} \cdot x_{24} \cdot x_{192} + k_{-25} \cdot x_{201} - k_{25} \cdot x_{24} \cdot x_{193} + k_{-25} \cdot x_{202} - k_{25} \cdot x_{24} \cdot x_{194} + k_{-25} \cdot x_{203} - k_{25} \cdot x_{24} \cdot x_{300} + k_{-25} \cdot x_{303} - k_{25} \cdot x_{24} \cdot x_{302} + k_{-25} \cdot x_{305} - k_{25} \cdot x_{24} \cdot x_{360} + k_{-25} \cdot x_{366} - k_{25} \cdot x_{24} \cdot x_{362} + k_{-25} \cdot x_{368} - k_{25} \cdot x_{24} \cdot x_{357} + k_{-25} \cdot x_{363} - k_{25} \cdot x_{24} \cdot x_{359} + k_{-25} \cdot x_{365} - k_{35} \cdot x_{24} \cdot x_{22} + k_{-35} \cdot x_{30} - k_{36} \cdot x_{24} + k_{-36} \cdot x_{22} - k_{40} \cdot x_{24} \cdot x_{39} + k_{-40} \cdot x_{38} - k_{64} \cdot x_{59} \cdot x_{24} + k_{-64} \cdot x_{101} - k_{64} \cdot x_{83} \cdot x_{24} + k_{-64} \cdot x_{102}$

(24) $\dot{x}_{25} = -k_4 \cdot x_{25} \cdot x_{12} + k_{-4} \cdot x_{88} + k_{17} \cdot x_{24} \cdot x_{23} - k_{-17} \cdot x_{25} - k_{18} \cdot x_{26} \cdot x_{25} + k_{-18} \cdot x_{27} - k_{19} \cdot x_{28} \cdot x_{25} + k_{-19} \cdot$

$x_{27}-k_{20}\cdot x_{25}\cdot x_{43}+k_{-20}\cdot x_{29}-k_{21}\cdot x_{25}\cdot x_{26}+k_{-21}\cdot x_{29}+k_{34}\cdot x_{15}\cdot x_{30}-k_{-34}\cdot x_{25}-k_{64}\cdot x_{59}\cdot x_{25}+k_{-64}\cdot x_{95}$

(25) $\dot{x}_{26}=-k_{18}\cdot x_{26}\cdot x_{25}+k_{-18}\cdot x_{27}-k_{18}\cdot x_{26}\cdot x_{35}+k_{-18}\cdot x_{36}-k_{18}\cdot x_{26}\cdot x_{19}+k_{-18}\cdot x_{20}-k_{18}\cdot x_{26}\cdot x_{66}+$
$k_{-18}\cdot x_{67}-k_{18}\cdot x_{26}\cdot x_{198}+k_{-18}\cdot x_{207}-k_{18}\cdot x_{26}\cdot x_{199}+k_{-18}\cdot x_{208}-k_{18}\cdot x_{26}\cdot x_{200}+k_{-18}\cdot x_{209}-k_{18}\cdot x_{26}\cdot x_{201}+$
$k_{-18}\cdot x_{210}-k_{18}\cdot x_{26}\cdot x_{202}+k_{-18}\cdot x_{211}-k_{18}\cdot x_{26}\cdot x_{203}+k_{-18}\cdot x_{212}-k_{18}\cdot x_{26}\cdot x_{234}+k_{-18}\cdot x_{243}-k_{18}\cdot x_{26}\cdot x_{235}+$
$k_{-18}\cdot x_{244}-k_{18}\cdot x_{26}\cdot x_{236}+k_{-18}\cdot x_{245}-k_{18}\cdot x_{26}\cdot x_{237}+k_{-18}\cdot x_{246}-k_{18}\cdot x_{26}\cdot x_{238}+k_{-18}\cdot x_{247}-k_{18}\cdot x_{26}\cdot x_{239}+$
$k_{-18}\cdot x_{248}-k_{18}\cdot x_{26}\cdot x_{303}+k_{-18}\cdot x_{306}-k_{18}\cdot x_{26}\cdot x_{305}+k_{-18}\cdot x_{308}-k_{18}\cdot x_{26}\cdot x_{315}+k_{-18}\cdot x_{318}-k_{18}\cdot x_{26}\cdot x_{317}+$
$k_{-18}\cdot x_{320}-k_{18}\cdot x_{26}\cdot x_{366}+k_{-18}\cdot x_{372}-k_{18}\cdot x_{26}\cdot x_{368}+k_{-18}\cdot x_{374}-k_{18}\cdot x_{26}\cdot x_{363}+k_{-18}\cdot x_{369}-k_{18}\cdot x_{26}\cdot x_{365}+$
$k_{-18}\cdot x_{371}-k_{18}\cdot x_{26}\cdot x_{390}+k_{-18}\cdot x_{396}-k_{18}\cdot x_{26}\cdot x_{392}+k_{-18}\cdot x_{398}-k_{18}\cdot x_{26}\cdot x_{387}+k_{-18}\cdot x_{393}-k_{18}\cdot x_{26}\cdot x_{389}+$
$k_{-18}\cdot x_{395}-k_{21}\cdot x_{315}\cdot x_{26}+k_{-21}\cdot x_{321}-k_{21}\cdot x_{317}\cdot x_{26}+k_{-21}\cdot x_{323}-k_{21}\cdot x_{303}\cdot x_{26}+k_{-21}\cdot x_{309}-k_{21}\cdot x_{305}\cdot x_{26}+$
$k_{-21}\cdot x_{311}-k_{21}\cdot x_{66}\cdot x_{26}+k_{-21}\cdot x_{68}-k_{21}\cdot x_{19}\cdot x_{26}+k_{-21}\cdot x_{21}-k_{21}\cdot x_{35}\cdot x_{26}+k_{-21}\cdot x_{37}-k_{21}\cdot x_{25}\cdot x_{26}+k_{-21}\cdot$
$x_{29}-k_{21}\cdot x_{198}\cdot x_{26}+k_{-21}\cdot x_{216}-k_{21}\cdot x_{199}\cdot x_{26}+k_{-21}\cdot x_{217}-k_{21}\cdot x_{200}\cdot x_{26}+k_{-21}\cdot x_{218}-k_{21}\cdot x_{201}\cdot x_{26}+k_{-21}\cdot$
$x_{219}-k_{21}\cdot x_{202}\cdot x_{26}+k_{-21}\cdot x_{220}-k_{21}\cdot x_{203}\cdot x_{26}+k_{-21}\cdot x_{221}-k_{21}\cdot x_{234}\cdot x_{26}+k_{-21}\cdot x_{252}-k_{21}\cdot x_{235}\cdot x_{26}+k_{-21}\cdot$
$x_{253}-k_{21}\cdot x_{236}\cdot x_{26}+k_{-21}\cdot x_{254}-k_{21}\cdot x_{237}\cdot x_{26}+k_{-21}\cdot x_{255}-k_{21}\cdot x_{238}\cdot x_{26}+k_{-21}\cdot x_{256}-k_{21}\cdot x_{239}\cdot x_{26}+k_{-21}\cdot$
$x_{257}-k_{21}\cdot x_{363}\cdot x_{26}+k_{-21}\cdot x_{375}-k_{21}\cdot x_{365}\cdot x_{26}+k_{-21}\cdot x_{377}-k_{21}\cdot x_{366}\cdot x_{26}+k_{-21}\cdot x_{378}-k_{21}\cdot x_{368}\cdot x_{26}+k_{-21}\cdot$
$x_{380}-k_{21}\cdot x_{387}\cdot x_{26}+k_{-21}\cdot x_{399}-k_{21}\cdot x_{389}\cdot x_{26}+k_{-21}\cdot x_{401}-k_{21}\cdot x_{390}\cdot x_{26}+k_{-21}\cdot x_{402}-k_{21}\cdot x_{392}\cdot x_{26}+k_{-21}\cdot$
$x_{404}-k_{112}\cdot x_{26}\cdot x_{104}+k_{-112}\cdot x_{264}-k_{112}\cdot x_{26}\cdot x_{261}+k_{-112}\cdot x_{265}-k_{112}\cdot x_{26}\cdot x_{262}+k_{-112}\cdot x_{266}-k_{112}\cdot x_{26}\cdot$
$x_{263}+k_{-112}\cdot x_{267}-k_{112}\cdot x_{26}\cdot x_{324}+k_{-112}\cdot x_{268}-k_{112}\cdot x_{26}\cdot x_{405}+k_{-112}\cdot x_{269}-k_{112}\cdot x_{26}\cdot x_{408}+k_{-112}\cdot x_{325}$

(26) $\dot{x}_{27}=-k_{4}\cdot x_{27}\cdot x_{12}+k_{-4}\cdot x_{89}+k_{18}\cdot x_{26}\cdot x_{25}-k_{-18}\cdot x_{27}+k_{19}\cdot x_{28}\cdot x_{25}-k_{-19}\cdot x_{27}$

(27) $\dot{x}_{28}=-k_{19}\cdot x_{28}\cdot x_{387}+k_{-19}\cdot x_{393}-k_{19}\cdot x_{28}\cdot x_{390}+k_{-19}\cdot x_{396}-k_{19}\cdot x_{28}\cdot x_{315}+k_{-19}\cdot x_{318}-k_{19}\cdot x_{28}\cdot$
$x_{303}+k_{-19}\cdot x_{306}-k_{19}\cdot x_{35}\cdot x_{28}+k_{-19}\cdot x_{36}-k_{19}\cdot x_{28}\cdot x_{25}+k_{-19}\cdot x_{27}-k_{19}\cdot x_{198}\cdot x_{28}+k_{-19}\cdot x_{207}-k_{19}\cdot$
$x_{199}\cdot x_{28}+k_{-19}\cdot x_{208}-k_{19}\cdot x_{200}\cdot x_{28}+k_{-19}\cdot x_{209}-k_{19}\cdot x_{28}\cdot x_{234}+k_{-19}\cdot x_{243}-k_{19}\cdot x_{28}\cdot x_{235}+k_{-19}\cdot x_{244}-$
$k_{19}\cdot x_{28}\cdot x_{236}+k_{-19}\cdot x_{245}-k_{19}\cdot x_{28}\cdot x_{363}+k_{-19}\cdot x_{369}-k_{19}\cdot x_{28}\cdot x_{366}+k_{-19}\cdot x_{372}-k_{28}\cdot x_{28}\cdot x_{41}+k_{-28}\cdot$
$x_{42}-k_{113}\cdot x_{28}\cdot x_{104}+k_{-113}\cdot x_{264}-k_{113}\cdot x_{28}\cdot x_{261}+k_{-113}\cdot x_{265}-k_{113}\cdot x_{28}\cdot x_{262}+k_{-113}\cdot x_{266}-k_{113}\cdot x_{28}\cdot$
$x_{263}+k_{-113}\cdot x_{267}-k_{113}\cdot x_{28}\cdot x_{324}+k_{-113}\cdot x_{268}-k_{113}\cdot x_{28}\cdot x_{405}+k_{-113}\cdot x_{269}-k_{113}\cdot x_{28}\cdot x_{479}+k_{-113}\cdot x_{325}$

(28) $\dot{x}_{29}=-k_{4}\cdot x_{29}\cdot x_{12}+k_{-4}\cdot x_{90}+k_{20}\cdot x_{25}\cdot x_{43}-k_{-20}\cdot x_{29}+k_{21}\cdot x_{25}\cdot x_{26}-k_{-21}\cdot x_{29}$

(29) $\dot{x}_{30}=-k_{33}\cdot x_{40}\cdot x_{30}+k_{-33}\cdot x_{38}-k_{34}\cdot x_{15}\cdot x_{30}+k_{-34}\cdot x_{25}-k_{34}\cdot x_{17}\cdot x_{30}+k_{-34}\cdot x_{19}-k_{34}\cdot x_{151}\cdot$
$x_{30}+k_{-34}\cdot x_{234}-k_{34}\cdot x_{152}\cdot x_{30}+k_{-34}\cdot x_{235}-k_{34}\cdot x_{153}\cdot x_{30}+k_{-34}\cdot x_{236}-k_{34}\cdot x_{165}\cdot x_{30}+k_{-34}\cdot x_{237}-$
$k_{34}\cdot x_{166}\cdot x_{30}+k_{-34}\cdot x_{238}-k_{34}\cdot x_{167}\cdot x_{30}+k_{-34}\cdot x_{239}-k_{34}\cdot x_{291}\cdot x_{30}+k_{-34}\cdot x_{315}-k_{34}\cdot x_{293}\cdot x_{30}+k_{-34}\cdot$
$x_{317}-k_{34}\cdot x_{341}\cdot x_{30}+k_{-34}\cdot x_{387}-k_{34}\cdot x_{343}\cdot x_{30}+k_{-34}\cdot x_{389}-k_{34}\cdot x_{344}\cdot x_{30}+k_{-34}\cdot x_{390}-k_{34}\cdot x_{346}\cdot x_{30}+$
$k_{-34}\cdot x_{392}+k_{35}\cdot x_{24}\cdot x_{22}-k_{-35}\cdot x_{30}-k_{41}\cdot x_{30}\cdot x_{33}+k_{-41}\cdot x_{35}-k_{41}\cdot x_{30}\cdot x_{64}+k_{-41}\cdot x_{66}-k_{41}\cdot x_{30}\cdot x_{180}+$
$k_{-41}\cdot x_{198}-k_{41}\cdot x_{30}\cdot x_{181}+k_{-41}\cdot x_{199}-k_{41}\cdot x_{30}\cdot x_{182}+k_{-41}\cdot x_{200}-k_{41}\cdot x_{30}\cdot x_{183}+k_{-41}\cdot x_{201}-k_{41}\cdot x_{30}\cdot$
$x_{184}+k_{-41}\cdot x_{202}-k_{41}\cdot x_{30}\cdot x_{185}+k_{-41}\cdot x_{203}-k_{41}\cdot x_{30}\cdot x_{297}+k_{-41}\cdot x_{303}-k_{41}\cdot x_{30}\cdot x_{299}+k_{-41}\cdot x_{305}-k_{41}\cdot$
$x_{30}\cdot x_{351}+k_{-41}\cdot x_{363}-k_{41}\cdot x_{30}\cdot x_{353}+k_{-41}\cdot x_{365}-k_{41}\cdot x_{30}\cdot x_{354}+k_{-41}\cdot x_{366}-k_{41}\cdot x_{30}\cdot x_{356}+k_{-41}\cdot x_{368}$

(30) $\dot{x}_{31}=-k_{22}\cdot x_{31}\cdot x_{15}+k_{-22}\cdot x_{32}-k_{22}\cdot x_{31}\cdot x_{17}+k_{-22}\cdot x_{63}-k_{22}\cdot x_{31}\cdot x_{151}+k_{-22b}\cdot x_{171}-k_{22}\cdot x_{31}\cdot$
$x_{152}+k_{-22b}\cdot x_{172}-k_{22}\cdot x_{31}\cdot x_{153}+k_{-22b}\cdot x_{173}-k_{22}\cdot x_{31}\cdot x_{165}+k_{-22b}\cdot x_{174}-k_{22}\cdot x_{31}\cdot x_{166}+k_{-22b}\cdot x_{175}-$
$k_{22}\cdot x_{31}\cdot x_{167}+k_{-22b}\cdot x_{176}-k_{22}\cdot x_{31}\cdot x_{291}+k_{-22b}\cdot x_{294}-k_{22}\cdot x_{31}\cdot x_{293}+k_{-22b}\cdot x_{296}-k_{22}\cdot x_{31}\cdot x_{341}+$
$k_{-22b}\cdot x_{347}-k_{22}\cdot x_{31}\cdot x_{343}+k_{-22b}\cdot x_{349}-k_{22}\cdot x_{31}\cdot x_{344}+k_{-22}\cdot x_{348}-k_{22}\cdot x_{31}\cdot x_{346}+k_{-22}\cdot x_{350}-k_{23}\cdot$
$x_{31}+k_{-23}\cdot x_{346}-k_{23}\cdot x_{31}+k_{-23}\cdot x_{346}-k_{23}\cdot x_{31}+k_{-23}\cdot x_{346}-k_{23}\cdot x_{31}+k_{-23}\cdot x_{346}-k_{23}\cdot x_{31}+k_{-23}\cdot$
$x_{346}-k_{23}\cdot x_{31}+k_{-23}\cdot x_{346}-k_{23}\cdot x_{31}+k_{-23}\cdot x_{346}-k_{23}\cdot x_{31}+k_{-23}\cdot x_{346}-k_{23}\cdot x_{31}+k_{-23}\cdot x_{346}-k_{23}\cdot$
$x_{31}+k_{-23}\cdot x_{346}-k_{23}\cdot x_{31}+k_{-23}\cdot x_{346}-k_{23}\cdot x_{31}+k_{-23}\cdot x_{346}-k_{23}\cdot x_{31}+k_{-23}\cdot x_{346}-k_{23}\cdot x_{31}+k_{-23}\cdot x_{346}$

(31) $\dot{x}_{32}=+k_{22}\cdot x_{31}\cdot x_{15}-k_{-22}\cdot x_{32}$

(32) $\dot{x}_{33}=-k_{16}\cdot x_{22}\cdot x_{33}+k_{-24}\cdot x_{34}+k_{37}\cdot x_{15}\cdot x_{40}-k_{-37}\cdot x_{33}-k_{41}\cdot x_{30}\cdot x_{33}+k_{-41}\cdot x_{35}$

(33) $\dot{x}_{34}=-k_{4}\cdot x_{34}\cdot x_{12}+k_{-4}\cdot x_{91}+k_{16}\cdot x_{22}\cdot x_{33}-k_{-24}\cdot x_{34}-k_{25}\cdot x_{24}\cdot x_{34}+k_{-25}\cdot x_{35}+k_{37}\cdot$
$x_{15}\cdot x_{39}-k_{-37}\cdot x_{34}-k_{101}\cdot x_{103}\cdot x_{34}+k_{-101}\cdot x_{419}$

(34) $\dot{x}_{35}=-k_{4}\cdot x_{35}\cdot x_{12}+k_{-4}\cdot x_{92}-k_{18}\cdot x_{26}\cdot x_{35}+k_{-18}\cdot x_{36}-k_{19}\cdot x_{35}\cdot x_{28}+k_{-19}\cdot x_{36}-k_{20}\cdot$
$x_{35}\cdot x_{43}+k_{-20}\cdot x_{37}-k_{21}\cdot x_{35}\cdot x_{26}+k_{-21}\cdot x_{37}+k_{25}\cdot x_{24}\cdot x_{34}-k_{-25}\cdot x_{35}+k_{32}\cdot x_{15}\cdot x_{38}-k_{-32}\cdot$

$x_{35} + k_{41} \cdot x_{30} \cdot x_{33} - k_{-41} \cdot x_{35} - k_{64} \cdot x_{59} \cdot x_{35} + k_{-64} \cdot x_{97}$

(35) $\dot{x}_{36} = -k_4 \cdot x_{36} \cdot x_{12} + k_{-4} \cdot x_{93} + k_{18} \cdot x_{26} \cdot x_{35} - k_{-18} \cdot x_{36} + k_{19} \cdot x_{35} \cdot x_{28} - k_{-19} \cdot x_{36}$

(36) $\dot{x}_{37} = -k_4 \cdot x_{37} \cdot x_{12} + k_{-4} \cdot x_{94} + k_{20} \cdot x_{35} \cdot x_{43} - k_{-20} \cdot x_{37} + k_{21} \cdot x_{35} \cdot x_{26} - k_{-21} \cdot x_{37}$

(37) $\dot{x}_{38} = -k_{32} \cdot x_{15} \cdot x_{38} + k_{-32} \cdot x_{35} - k_{32} \cdot x_{17} \cdot x_{38} + k_{-32} \cdot x_{66} - k_{32} \cdot x_{151} \cdot x_{38} + k_{-32} \cdot x_{198} - k_{32} \cdot x_{152} \cdot x_{38} + k_{-32} \cdot x_{199} - k_{32} \cdot x_{153} \cdot x_{38} + k_{-32} \cdot x_{200} - k_{32} \cdot x_{165} \cdot x_{38} + k_{-32} \cdot x_{201} - k_{32} \cdot x_{166} \cdot x_{38} + k_{-32} \cdot x_{202} - k_{32} \cdot x_{167} \cdot x_{38} + k_{-32} \cdot x_{203} - k_{32} \cdot x_{291} \cdot x_{38} + k_{-32} \cdot x_{303} - k_{32} \cdot x_{293} \cdot x_{38} + k_{-32} \cdot x_{305} - k_{32} \cdot x_{341} \cdot x_{38} + k_{-32} \cdot x_{363} - k_{32} \cdot x_{343} \cdot x_{38} + k_{-32} \cdot x_{365} - k_{32} \cdot x_{344} \cdot x_{38} + k_{-32} \cdot x_{366} - k_{32} \cdot x_{346} \cdot x_{38} + k_{-32} \cdot x_{368} + k_{33} \cdot x_{40} \cdot x_{30} - k_{-33} \cdot x_{38} + k_{40} \cdot x_{24} \cdot x_{39} - k_{-40} \cdot x_{38}$

(38) $\dot{x}_{39} = +k_{16} \cdot x_{22} \cdot x_{40} - k_{-24} \cdot x_{39} - k_{37} \cdot x_{15} \cdot x_{39} + k_{-37} \cdot x_{34} - k_{37} \cdot x_{17} \cdot x_{39} + k_{-37} \cdot x_{65} - k_{37} \cdot x_{151} \cdot x_{39} + k_{-37} \cdot x_{189} - k_{37} \cdot x_{152} \cdot x_{39} + k_{-37} \cdot x_{190} - k_{37} \cdot x_{153} \cdot x_{39} + k_{-37} \cdot x_{191} - k_{37} \cdot x_{165} \cdot x_{39} + k_{-37} \cdot x_{192} - k_{37} \cdot x_{166} \cdot x_{39} + k_{-37} \cdot x_{193} - k_{37} \cdot x_{167} \cdot x_{39} + k_{-37} \cdot x_{194} - k_{37} \cdot x_{291} \cdot x_{39} + k_{-37} \cdot x_{300} - k_{37} \cdot x_{293} \cdot x_{39} + k_{-37} \cdot x_{302} - k_{37} \cdot x_{341} \cdot x_{39} + k_{-37} \cdot x_{357} - k_{37} \cdot x_{343} \cdot x_{39} + k_{-37} \cdot x_{359} - k_{37} \cdot x_{344} \cdot x_{39} + k_{-37} \cdot x_{360} - k_{37} \cdot x_{346} \cdot x_{39} + k_{-37} \cdot x_{362} - k_{40} \cdot x_{24} \cdot x_{39} + k_{-40} \cdot x_{38}$

(39) $\dot{x}_{40} = -k_{16} \cdot x_{22} \cdot x_{40} + k_{-24} \cdot x_{39} - k_{33} \cdot x_{40} \cdot x_{30} + k_{-33} \cdot x_{38} - k_{37} \cdot x_{15} \cdot x_{40} + k_{-37} \cdot x_{33} - k_{37} \cdot x_{17} \cdot x_{40} + k_{-37} \cdot x_{64} - k_{37} \cdot x_{151} \cdot x_{40} + k_{-37} \cdot x_{180} - k_{37} \cdot x_{152} \cdot x_{40} + k_{-37} \cdot x_{181} - k_{37} \cdot x_{153} \cdot x_{40} + k_{-37} \cdot x_{182} - k_{37} \cdot x_{165} \cdot x_{40} + k_{-37} \cdot x_{183} - k_{37} \cdot x_{166} \cdot x_{40} + k_{-37} \cdot x_{184} - k_{37} \cdot x_{167} \cdot x_{40} + k_{-37} \cdot x_{185} - k_{37} \cdot x_{291} \cdot x_{40} + k_{-37} \cdot x_{297} - k_{37} \cdot x_{293} \cdot x_{40} + k_{-37} \cdot x_{299} - k_{37} \cdot x_{341} \cdot x_{40} + k_{-37} \cdot x_{351} - k_{37} \cdot x_{343} \cdot x_{40} + k_{-37} \cdot x_{353} - k_{37} \cdot x_{344} \cdot x_{40} + k_{-37} \cdot x_{354} - k_{37} \cdot x_{346} \cdot x_{40} + k_{-37} \cdot x_{356}$

(40) $\dot{x}_{41} = -k_{28} \cdot x_{28} \cdot x_{41} + k_{-28} \cdot x_{42} - k_{28} \cdot x_{69} \cdot x_{41} + k_{-28} \cdot x_{70} - k_{43} \cdot x_{41} \cdot x_{44} + k_{-43} \cdot x_{46} - k_{43} \cdot x_{41} \cdot x_{44} + k_{-43} \cdot x_{73}$

(41) $\dot{x}_{42} = +k_{28} \cdot x_{28} \cdot x_{41} - k_{-28} \cdot x_{42} + k_{29} \cdot x_{43} \cdot x_{45} - k_{-29} \cdot x_{42}$

(42) $\dot{x}_{43} = -k_{20} \cdot x_{43} \cdot x_{366} + k_{-20} \cdot x_{378} - k_{20} \cdot x_{43} \cdot x_{363} + k_{-20} \cdot x_{375} - k_{20} \cdot x_{234} \cdot x_{43} + k_{-20} \cdot x_{252} - k_{20} \cdot x_{235} \cdot x_{43} + k_{-20} \cdot x_{253} - k_{20} \cdot x_{236} \cdot x_{43} + k_{-20} \cdot x_{254} - k_{20} \cdot x_{25} \cdot x_{43} + k_{-20} \cdot x_{29} - k_{20} \cdot x_{35} \cdot x_{43} + k_{-20} \cdot x_{37} - k_{20} \cdot x_{43} \cdot x_{198} + k_{-20} \cdot x_{216} - k_{20} \cdot x_{43} \cdot x_{199} + k_{-20} \cdot x_{217} - k_{20} \cdot x_{43} \cdot x_{200} + k_{-20} \cdot x_{218} - k_{20} \cdot x_{43} \cdot x_{303} + k_{-20} \cdot x_{309} - k_{20} \cdot x_{315} \cdot x_{43} + k_{-20} \cdot x_{321} - k_{20} \cdot x_{390} \cdot x_{43} + k_{-20} \cdot x_{402} - k_{20} \cdot x_{387} \cdot x_{43} + k_{-20} \cdot x_{399} - k_{29} \cdot x_{43} \cdot x_{45} + k_{-29} \cdot x_{42}$

(43) $\dot{x}_{44} = -k_{42} \cdot x_{44} \cdot x_{72} + k_{-42} \cdot x_{73} - k_{42} \cdot x_{44} \cdot x_{45} + k_{-42} \cdot x_{46} - k_{43} \cdot x_{41} \cdot x_{44} + k_{-43} \cdot x_{46} - k_{43} \cdot x_{41} \cdot x_{44} + k_{-43} \cdot x_{73}$

(44) $\dot{x}_{45} = -k_{29} \cdot x_{43} \cdot x_{45} + k_{-29} \cdot x_{42} - k_{42} \cdot x_{44} \cdot x_{45} + k_{-42} \cdot x_{46} - k_{44} \cdot x_{47} \cdot x_{45} + k_{-52} \cdot x_{48} - k_{44} \cdot x_{49} \cdot x_{45} + k_{-52} \cdot x_{50} - k_{45} \cdot x_{49} \cdot x_{45} + k_{-45} \cdot x_{48} - k_{47} \cdot x_{51} \cdot x_{45} + k_{-47} \cdot x_{50} - k_{114} \cdot x_{497} \cdot x_{45} + k_{-114} \cdot x_{472}$

(45) $\dot{x}_{46} = +k_{42} \cdot x_{44} \cdot x_{45} - k_{-42} \cdot x_{46} + k_{43} \cdot x_{41} \cdot x_{44} - k_{-43} \cdot x_{46}$

(46) $\dot{x}_{47} = -k_{44} \cdot x_{47} \cdot x_{72} + k_{-52} \cdot x_{74} - k_{44} \cdot x_{47} \cdot x_{45} + k_{-52} \cdot x_{48} - k_{49} \cdot x_{47} \cdot x_{53} + k_{-49} \cdot x_{54} - k_{49} \cdot x_{47} \cdot x_{53} + k_{-49} \cdot x_{79}$

(47) $\dot{x}_{48} = +k_{44} \cdot x_{47} \cdot x_{45} - k_{-52} \cdot x_{48} + k_{45} \cdot x_{49} \cdot x_{45} - k_{-45} \cdot x_{48}$

(48) $\dot{x}_{49} = -k_{44} \cdot x_{49} \cdot x_{45} + k_{-52} \cdot x_{50} - k_{45} \cdot x_{49} \cdot x_{45} + k_{-45} \cdot x_{48} - k_{49} \cdot x_{49} \cdot x_{53} + k_{-49} \cdot x_{52} - k_{50} \cdot x_{53} \cdot x_{49} + k_{-50} \cdot x_{54}$

(49) $\dot{x}_{50} = +k_{44} \cdot x_{49} \cdot x_{45} - k_{-52} \cdot x_{50} + k_{47} \cdot x_{51} \cdot x_{45} - k_{-47} \cdot x_{50}$

(50) $\dot{x}_{51} = -k_{47} \cdot x_{51} \cdot x_{45} + k_{-47} \cdot x_{50} - k_{48} \cdot x_{51} \cdot x_{53} + k_{-48} \cdot x_{52} - k_{52} \cdot x_{55} \cdot x_{51} + k_{-44} \cdot x_{56} - k_{52} \cdot x_{51} \cdot x_{57} + k_{-44} \cdot x_{58} - k_{53} \cdot x_{51} \cdot x_{57} + k_{-53} \cdot x_{56} - k_{55} \cdot x_{59} \cdot x_{51} + k_{-55} \cdot x_{58}$

(51) $\dot{x}_{52} = +k_{48} \cdot x_{51} \cdot x_{53} - k_{-48} \cdot x_{52} + k_{49} \cdot x_{49} \cdot x_{53} - k_{-49} \cdot x_{52}$

(52) $\dot{x}_{53} = -k_{48} \cdot x_{77} \cdot x_{53} + k_{-48} \cdot x_{78} - k_{48} \cdot x_{51} \cdot x_{53} + k_{-48} \cdot x_{52} - k_{49} \cdot x_{49} \cdot x_{53} + k_{-49} \cdot x_{52} - k_{49} \cdot x_{47} \cdot x_{53} + k_{-49} \cdot x_{54} - k_{49} \cdot x_{47} \cdot x_{53} + k_{-49} \cdot x_{79} - k_{49} \cdot x_{75} \cdot x_{53} + k_{-49} \cdot x_{78} - k_{50} \cdot x_{53} \cdot x_{75} + k_{-50} \cdot x_{79} - k_{50} \cdot x_{53} \cdot x_{49} + k_{-50} \cdot x_{54}$

(53) $\dot{x}_{54} = +k_{49} \cdot x_{47} \cdot x_{53} - k_{-49} \cdot x_{54} + k_{50} \cdot x_{53} \cdot x_{49} - k_{-50} \cdot x_{54}$

(54) $\dot{x}_{55} = -k_{52} \cdot x_{55} \cdot x_{51} + k_{-44} \cdot x_{56} - k_{52} \cdot x_{55} \cdot x_{77} + k_{-44} \cdot x_{80} - k_{57} \cdot x_{55} \cdot x_{60} + k_{-57} \cdot x_{62} - k_{57} \cdot x_{55} \cdot x_{60} + k_{-57} \cdot x_{85}$

(55) $\dot{x}_{56} = +k_{52} \cdot x_{55} \cdot x_{51} - k_{-44} \cdot x_{56} + k_{53} \cdot x_{51} \cdot x_{57} - k_{-53} \cdot x_{56}$

(56) $\dot{x}_{57} = -k_{52} \cdot x_{51} \cdot x_{57} + k_{-44} \cdot x_{58} - k_{53} \cdot x_{51} \cdot x_{57} + k_{-53} \cdot x_{56} - k_{57} \cdot x_{57} \cdot x_{60} + k_{-57} \cdot x_{61} - k_{58} \cdot x_{60} \cdot x_{57} + k_{-58} \cdot x_{62}$

(57) $\dot{x}_{58} = +k_{52} \cdot x_{51} \cdot x_{57} - k_{-44} \cdot x_{58} + k_{55} \cdot x_{59} \cdot x_{51} - k_{-55} \cdot x_{58}$

(58) $\dot{x}_{59} = -k_{55} \cdot x_{59} \cdot x_{51} + k_{-55} \cdot x_{58} - k_{56} \cdot x_{59} \cdot x_{60} + k_{-56} \cdot x_{61} - k_{64} \cdot x_{59} \cdot x_{25} + k_{-64} \cdot x_{95} - k_{64} \cdot x_{59} \cdot x_{35} + k_{-64} \cdot x_{97} - k_{64} \cdot x_{59} \cdot x_{24} + k_{-64} \cdot x_{101} - k_{65} \cdot x_{59} \cdot x_{99} + k_{-65} \cdot x_{95} - k_{65} \cdot x_{59} \cdot x_{419} + k_{-65} \cdot x_{97} - k_{65} \cdot x_{59} \cdot x_{103} + k_{-65} \cdot x_{101} - k_{110} \cdot x_{59} \cdot x_{486} + k_{-110} \cdot x_{431} - k_{110} \cdot x_{59} \cdot x_{445} + k_{-110} \cdot x_{433} - k_{110} \cdot x_{59} \cdot x_{446} + k_{-110} \cdot x_{435} - k_{110} \cdot x_{59} \cdot x_{447} + k_{-110} \cdot x_{438} - k_{110} \cdot x_{59} \cdot x_{454} + k_{-110} \cdot x_{474} - k_{110} \cdot x_{59} \cdot x_{457} + k_{-110} \cdot x_{477} - k_{110} \cdot x_{59} \cdot x_{460} + k_{-110} \cdot x_{480} - k_{111} \cdot x_{59} \cdot x_{491} + k_{-111} \cdot x_{477} - k_{111} \cdot x_{59} \cdot x_{490} + k_{-111} \cdot x_{474} - k_{111} \cdot x_{59} \cdot x_{410} + k_{-111} \cdot x_{438} - k_{111} \cdot x_{59} \cdot x_{409} + k_{-111} \cdot x_{435} - k_{111} \cdot x_{59} \cdot x_{430} + k_{-111} \cdot x_{433} - k_{111} \cdot x_{59} \cdot x_{488} + k_{-111} \cdot x_{431} - k_{111} \cdot x_{59} \cdot x_{487} + k_{-111} \cdot x_{480}$

(59) $\dot{x}_{60} = -k_{56} \cdot x_{59} \cdot x_{60} + k_{-56} \cdot x_{61} - k_{56} \cdot x_{83} \cdot x_{60} + k_{-56} \cdot x_{84} - k_{57} \cdot x_{81} \cdot x_{60} + k_{-57} \cdot x_{84} - k_{57} \cdot x_{57} \cdot x_{60} + k_{-57} \cdot x_{61} - k_{57} \cdot x_{55} \cdot x_{60} + k_{-57} \cdot x_{62} - k_{57} \cdot x_{55} \cdot x_{60} + k_{-57} \cdot x_{85} - k_{58} \cdot x_{60} \cdot x_{57} + k_{-58} \cdot x_{62} - k_{58} \cdot x_{60} \cdot x_{81} + k_{-58} \cdot x_{85} - k_{60} \cdot x_{60} + k_{-60} \cdot x_{81} - k_{60} \cdot x_{60} + k_{-60} \cdot x_{81} - k_{60} \cdot x_{60} + k_{-60} \cdot x_{81} - k_{60} \cdot x_{60} + k_{-60} \cdot x_{81} - k_{60} \cdot x_{60} + k_{-60} \cdot x_{81} - k_{60} \cdot x_{60} + k_{-60} \cdot x_{81} - k_{60} \cdot x_{60} + k_{-60} \cdot x_{81} - k_{60} \cdot x_{60} + k_{-60} \cdot x_{81} - k_{60} \cdot x_{60} + k_{-60} \cdot x_{81} - k_{60} \cdot x_{60} + k_{-60} \cdot x_{81} - k_{60} \cdot x_{60} + k_{-60} \cdot x_{81} - k_{60} \cdot x_{60} + k_{-60} \cdot x_{81} - k_{60} \cdot x_{60} + k_{-60} \cdot x_{81} - k_{60b} \cdot x_{60} + k_{-60b} \cdot x_{81} - k_{60b} \cdot x_{60} + k_{-60b} \cdot x_{81} - k_{60b} \cdot x_{60} + k_{-60b} \cdot x_{81} - k_{60b} \cdot x_{60} + k_{-60} \cdot x_{81} - k_{60c} \cdot x_{60} + k_{-60} \cdot x_{81} - k_{61} \cdot x_{60} + k_{-61} \cdot x_{81} - k_{62b} \cdot x_{60} + k_{-60b} \cdot x_{81} - k_{62b} \cdot x_{60} + k_{-60b} \cdot x_{81} - k_{62b} \cdot x_{60} + k_{-60b} \cdot x_{81} - k_{62b} \cdot x_{60} + k_{-60b} \cdot x_{81} - k_{62b} \cdot x_{60} + k_{-60b} \cdot x_{81} - k_{62b} \cdot x_{60} + k_{-60b} \cdot x_{81} - k_{62b} \cdot x_{60} + k_{-60b} \cdot x_{81} - k_{62b} \cdot x_{60} + k_{-60b} \cdot x_{81} - k_{62b} \cdot x_{60} + k_{-60b} \cdot x_{81}$

(60) $\dot{x}_{61} = +k_{56} \cdot x_{59} \cdot x_{60} - k_{-56} \cdot x_{61} + k_{57} \cdot x_{57} \cdot x_{60} - k_{-57} \cdot x_{61}$

(61) $\dot{x}_{62} = +k_{57} \cdot x_{55} \cdot x_{60} - k_{-57} \cdot x_{62} + k_{58} \cdot x_{60} \cdot x_{57} - k_{-58} \cdot x_{62}$

(62) $\dot{x}_{63} = +k_{22} \cdot x_{31} \cdot x_{17} - k_{-22} \cdot x_{63}$

(63) $\dot{x}_{64} = -k_{16} \cdot x_{22} \cdot x_{64} + k_{-24} \cdot x_{65} + k_{37} \cdot x_{17} \cdot x_{40} - k_{-37} \cdot x_{64} - k_{41} \cdot x_{30} \cdot x_{64} + k_{-41} \cdot x_{66}$

(64) $\dot{x}_{65} = -k_{5} \cdot x_{9} \cdot x_{65} + k_{-5} \cdot x_{91} + k_{16} \cdot x_{22} \cdot x_{64} - k_{-24} \cdot x_{65} - k_{25} \cdot x_{24} \cdot x_{65} + k_{-25} \cdot x_{66} + k_{37} \cdot x_{17} \cdot x_{39} - k_{-37} \cdot x_{65} - k_{101} \cdot x_{103} \cdot x_{65} + k_{-101} \cdot x_{420}$

(65) $\dot{x}_{66} = -k_{5} \cdot x_{9} \cdot x_{66} + k_{-5} \cdot x_{92} - k_{18} \cdot x_{26} \cdot x_{66} + k_{-18} \cdot x_{67} - k_{19} \cdot x_{66} \cdot x_{69} + k_{-19} \cdot x_{67} - k_{20} \cdot x_{71} \cdot x_{66} + k_{-20} \cdot x_{68} - k_{21} \cdot x_{66} \cdot x_{26} + k_{-21} \cdot x_{68} + k_{25} \cdot x_{24} \cdot x_{65} - k_{-25} \cdot x_{66} + k_{32} \cdot x_{17} \cdot x_{38} - k_{-32} \cdot x_{66} + k_{41} \cdot x_{30} \cdot x_{64} - k_{-41} \cdot x_{66} - k_{64} \cdot x_{83} \cdot x_{66} + k_{-64} \cdot x_{98}$

(66) $\dot{x}_{67} = -k_{5} \cdot x_{9} \cdot x_{67} + k_{-5} \cdot x_{93} + k_{18} \cdot x_{26} \cdot x_{66} - k_{-18} \cdot x_{67} + k_{19} \cdot x_{66} \cdot x_{69} - k_{-19} \cdot x_{67}$

(67) $\dot{x}_{68} = -k_{5} \cdot x_{68} \cdot x_{9} + k_{-5} \cdot x_{94} + k_{20} \cdot x_{71} \cdot x_{66} - k_{-20} \cdot x_{68} + k_{21} \cdot x_{66} \cdot x_{26} - k_{-21} \cdot x_{68}$

(68) $\dot{x}_{69} = -k_{19} \cdot x_{69} \cdot x_{389} + k_{-19} \cdot x_{395} - k_{19} \cdot x_{69} \cdot x_{392} + k_{-19} \cdot x_{398} - k_{19} \cdot x_{69} \cdot x_{317} + k_{-19} \cdot x_{320} - k_{19} \cdot x_{69} \cdot x_{305} + k_{-19} \cdot x_{308} - k_{19} \cdot x_{66} \cdot x_{69} + k_{-19} \cdot x_{67} - k_{19} \cdot x_{69} \cdot x_{19} + k_{-19} \cdot x_{20} - k_{19} \cdot x_{201} \cdot x_{69} + k_{-19} \cdot x_{210} - k_{19} \cdot x_{202} \cdot x_{69} + k_{-19} \cdot x_{211} - k_{19} \cdot x_{203} \cdot x_{69} + k_{-19} \cdot x_{212} - k_{19} \cdot x_{237} \cdot x_{69} + k_{-19} \cdot x_{246} - k_{19} \cdot x_{238} \cdot x_{69} + k_{-19} \cdot x_{247} - k_{19} \cdot x_{239} \cdot x_{69} + k_{-19} \cdot x_{248} - k_{19} \cdot x_{69} \cdot x_{365} + k_{-19} \cdot x_{371} - k_{19} \cdot x_{69} \cdot x_{368} + k_{-19} \cdot x_{374} - k_{28} \cdot x_{69} \cdot x_{41} + k_{-28} \cdot x_{70}$

(69) $\dot{x}_{70} = +k_{28} \cdot x_{69} \cdot x_{41} - k_{-28} \cdot x_{70} + k_{29} \cdot x_{71} \cdot x_{72} - k_{-29} \cdot x_{70}$

(70) $\dot{x}_{71} = -k_{20} \cdot x_{71} \cdot x_{368} + k_{-20} \cdot x_{380} - k_{20} \cdot x_{71} \cdot x_{365} + k_{-20} \cdot x_{377} - k_{20} \cdot x_{71} \cdot x_{237} + k_{-20} \cdot x_{255} - k_{20} \cdot x_{71} \cdot x_{238} + k_{-20} \cdot x_{256} - k_{20} \cdot x_{71} \cdot x_{239} + k_{-20} \cdot x_{257} - k_{20} \cdot x_{71} \cdot x_{19} + k_{-20} \cdot x_{21} - k_{20} \cdot x_{71} \cdot x_{66} + k_{-20} \cdot x_{68} - k_{20} \cdot$

$x_{71} \cdot x_{201} + k_{-20} \cdot x_{219} - k_{20} \cdot x_{71} \cdot x_{202} + k_{-20} \cdot x_{220} - k_{20} \cdot x_{71} \cdot x_{203} + k_{-20} \cdot x_{221} - k_{20} \cdot x_{71} \cdot x_{305} + k_{-20} \cdot x_{311} -$
$k_{20} \cdot x_{317} \cdot x_{71} + k_{-20} \cdot x_{323} - k_{20} \cdot x_{392} \cdot x_{71} + k_{-20} \cdot x_{404} - k_{20} \cdot x_{389} \cdot x_{71} + k_{-20} \cdot x_{401} - k_{29} \cdot x_{71} \cdot x_{72} + k_{-29} \cdot x_{70}$
(71) $\dot{x}_{72} = -k_{29} \cdot x_{71} \cdot x_{72} + k_{-29} \cdot x_{70} - k_{42} \cdot x_{44} \cdot x_{72} + k_{-42} \cdot x_{73} - k_{44} \cdot x_{72} \cdot x_{75} + k_{-52} \cdot x_{76} - k_{44} \cdot x_{47} \cdot$
$x_{72} + k_{-52} \cdot x_{74} - k_{45} \cdot x_{75} \cdot x_{72} + k_{-45} \cdot x_{74} - k_{47} \cdot x_{72} \cdot x_{77} + k_{-47} \cdot x_{76} - k_{114} \cdot x_{497} \cdot x_{72} + k_{-114} \cdot x_{484}$
(72) $\dot{x}_{73} = +k_{42} \cdot x_{44} \cdot x_{72} - k_{-42} \cdot x_{73} + k_{43} \cdot x_{41} \cdot x_{44} - k_{-43} \cdot x_{73}$
(73) $\dot{x}_{74} = +k_{44} \cdot x_{47} \cdot x_{72} - k_{-52} \cdot x_{74} + k_{45} \cdot x_{75} \cdot x_{72} - k_{-45} \cdot x_{74}$
(74) $\dot{x}_{75} = -k_{44} \cdot x_{72} \cdot x_{75} + k_{-52} \cdot x_{76} - k_{45} \cdot x_{75} \cdot x_{72} + k_{-45} \cdot x_{74} - k_{49} \cdot x_{75} \cdot x_{53} + k_{-49} \cdot x_{78} -$
$k_{50} \cdot x_{53} \cdot x_{75} + k_{-50} \cdot x_{79}$
(75) $\dot{x}_{76} = +k_{44} \cdot x_{72} \cdot x_{75} - k_{-52} \cdot x_{76} + k_{47} \cdot x_{72} \cdot x_{77} - k_{-47} \cdot x_{76}$
(76) $\dot{x}_{77} = -k_{47} \cdot x_{72} \cdot x_{77} + k_{-47} \cdot x_{76} - k_{48} \cdot x_{77} \cdot x_{53} + k_{-48} \cdot x_{78} - k_{52} \cdot x_{55} \cdot x_{77} + k_{-44} \cdot x_{80} -$
$k_{52} \cdot x_{77} \cdot x_{81} + k_{-44} \cdot x_{82} - k_{53} \cdot x_{81} \cdot x_{77} + k_{-53} \cdot x_{80} - k_{55} \cdot x_{83} \cdot x_{77} + k_{-55} \cdot x_{82}$
(77) $\dot{x}_{78} = +k_{48} \cdot x_{77} \cdot x_{53} - k_{-48} \cdot x_{78} + k_{49} \cdot x_{75} \cdot x_{53} - k_{-49} \cdot x_{78}$
(78) $\dot{x}_{79} = +k_{49} \cdot x_{47} \cdot x_{53} - k_{-49} \cdot x_{79} + k_{50} \cdot x_{53} \cdot x_{75} - k_{-50} \cdot x_{79}$
(79) $\dot{x}_{80} = +k_{52} \cdot x_{55} \cdot x_{77} - k_{-44} \cdot x_{80} + k_{53} \cdot x_{81} \cdot x_{77} - k_{-53} \cdot x_{80}$
(80) $\dot{x}_{81} = -k_{52} \cdot x_{77} \cdot x_{81} + k_{-44} \cdot x_{82} - k_{53} \cdot x_{81} \cdot x_{77} + k_{-53} \cdot x_{80} - k_{57} \cdot x_{81} \cdot x_{60} + k_{-57} \cdot x_{84} - k_{58} \cdot x_{60} \cdot x_{81} +$
$k_{-58} \cdot x_{85} + k_{60} \cdot x_{60} - k_{-60} \cdot x_{81} + k_{60} \cdot x_{60} - k_{-60} \cdot x_{81} + k_{60} \cdot x_{60} - k_{-60} \cdot x_{81} + k_{60} \cdot x_{60} - k_{-60} \cdot x_{81} + k_{60} \cdot x_{60} -$
$k_{-60} \cdot x_{81} + k_{60} \cdot x_{60} - k_{-60} \cdot x_{81} + k_{60} \cdot x_{60} - k_{-60} \cdot x_{81} + k_{60} \cdot x_{60} - k_{-60} \cdot x_{81} + k_{60} \cdot x_{60} - k_{-60} \cdot x_{81} + k_{60} \cdot x_{60} -$
$k_{-60} \cdot x_{81} + k_{60} \cdot x_{60} - k_{-60} \cdot x_{81} + k_{60} \cdot x_{60} - k_{-60} \cdot x_{81} + k_{60} \cdot x_{60} - k_{-60} \cdot x_{81} + k_{60b} \cdot x_{60} - k_{-60b} \cdot x_{81} + k_{60b} \cdot x_{60} -$
$k_{-60b} \cdot x_{81} + k_{60b} \cdot x_{60} - k_{-60b} \cdot x_{81} + k_{60b} \cdot x_{60} - k_{-60} \cdot x_{81} + k_{60b} \cdot x_{60} - k_{-60} \cdot x_{81} + k_{60b} \cdot x_{60} - k_{-60} \cdot x_{81} + k_{60b} \cdot$
$x_{60} - k_{-60} \cdot x_{81} + k_{60b} \cdot x_{60} - k_{-60} \cdot x_{81} + k_{60b} \cdot x_{60} - k_{-60} \cdot x_{81} + k_{60b} \cdot x_{60} - k_{-60} \cdot x_{81} + k_{60b} \cdot x_{60} - k_{-60} \cdot x_{81} +$
$k_{60b} \cdot x_{60} - k_{-60} \cdot x_{81} + k_{60b} \cdot x_{60} - k_{-60} \cdot x_{81} + k_{60b} \cdot x_{60} - k_{-60} \cdot x_{81} + k_{60b} \cdot x_{60} - k_{-60} \cdot x_{81} + k_{60b} \cdot x_{60} - k_{-60} \cdot$
$x_{81} + k_{60b} \cdot x_{60} - k_{-60} \cdot x_{81} + k_{60b} \cdot x_{60} - k_{-60} \cdot x_{81} + k_{60b} \cdot x_{60} - k_{-60} \cdot x_{81} + k_{60b} \cdot x_{60} - k_{-60} \cdot x_{81} + k_{60b} \cdot x_{60} -$
$k_{-60} \cdot x_{81} + k_{60b} \cdot x_{60} - k_{-60} \cdot x_{81} + k_{60b} \cdot x_{60} - k_{-60} \cdot x_{81} + k_{60b} \cdot x_{60} - k_{-60} \cdot x_{81} + k_{60b} \cdot x_{60} - k_{-60} \cdot x_{81} + k_{60b} \cdot$
$x_{60} - k_{-60} \cdot x_{81} + k_{60b} \cdot x_{60} - k_{-60} \cdot x_{81} + k_{60b} \cdot x_{60} - k_{-60} \cdot x_{81} + k_{60b} \cdot x_{60} - k_{-60} \cdot x_{81} + k_{60b} \cdot x_{60} - k_{-60} \cdot x_{81} +$
$k_{60b} \cdot x_{60} - k_{-60} \cdot x_{81} + k_{60b} \cdot x_{60} - k_{-60} \cdot x_{81} + k_{60b} \cdot x_{60} - k_{-60} \cdot x_{81} + k_{60b} \cdot x_{60} - k_{-60} \cdot x_{81} + k_{60b} \cdot x_{60} - k_{-60} \cdot$
$x_{81} + k_{60b} \cdot x_{60} - k_{-60} \cdot x_{81} + k_{60b} \cdot x_{60} - k_{-60} \cdot x_{81} + k_{60b} \cdot x_{60} - k_{-60} \cdot x_{81} + k_{60c} \cdot x_{60} - k_{-60} \cdot x_{81} + k_{60c} \cdot x_{60} -$
$k_{-60} \cdot x_{81} + k_{60c} \cdot x_{60} - k_{-60} \cdot x_{81} + k_{60c} \cdot x_{60} - k_{-60} \cdot x_{81} + k_{60c} \cdot x_{60} - k_{-60} \cdot x_{81} + k_{60c} \cdot x_{60} - k_{-60} \cdot x_{81} + k_{60c} \cdot$
$x_{60} - k_{-60} \cdot x_{81} + k_{60c} \cdot x_{60} - k_{-60} \cdot x_{81} + k_{60c} \cdot x_{60} - k_{-60} \cdot x_{81} + k_{60c} \cdot x_{60} - k_{-60} \cdot x_{81} + k_{60c} \cdot x_{60} - k_{-60} \cdot x_{81} +$
$k_{60c} \cdot x_{60} - k_{-60} \cdot x_{81} + k_{60c} \cdot x_{60} - k_{-60} \cdot x_{81} + k_{60c} \cdot x_{60} - k_{-60} \cdot x_{81} + k_{60c} \cdot x_{60} - k_{-60} \cdot x_{81} + k_{60c} \cdot x_{60} - k_{-60} \cdot$
$x_{81} + k_{60c} \cdot x_{60} - k_{-60} \cdot x_{81} + k_{60c} \cdot x_{60} - k_{-60} \cdot x_{81} + k_{60c} \cdot x_{60} - k_{-60} \cdot x_{81} + k_{60c} \cdot x_{60} - k_{-60} \cdot x_{81} + k_{61} \cdot x_{60} -$
$k_{-61} \cdot x_{81} + k_{62b} \cdot x_{60} - k_{-60b} \cdot x_{81} + k_{62b} \cdot x_{60} - k_{-60b} \cdot x_{81} + k_{62b} \cdot x_{60} - k_{-60b} \cdot x_{81} + k_{62b} \cdot x_{60} - k_{-60b} \cdot x_{81} + k_{62b} \cdot$
$x_{60} - k_{-60b} \cdot x_{81} + k_{62b} \cdot x_{60} - k_{-60b} \cdot x_{81} + k_{62b} \cdot x_{60} - k_{-60b} \cdot x_{81} + k_{62b} \cdot x_{60} - k_{-60b} \cdot x_{81} + k_{62b} \cdot x_{60} - k_{-60b} \cdot x_{81}$
(81) $\dot{x}_{82} = +k_{52} \cdot x_{77} \cdot x_{81} - k_{-44} \cdot x_{82} + k_{55} \cdot x_{83} \cdot x_{77} - k_{-55} \cdot x_{82}$
(82) $\dot{x}_{83} = -k_{55} \cdot x_{83} \cdot x_{77} + k_{-55} \cdot x_{82} - k_{56} \cdot x_{83} \cdot x_{60} + k_{-56} \cdot x_{84} - k_{64} \cdot x_{83} \cdot x_{19} + k_{-64} \cdot x_{96} - k_{64} \cdot x_{83} \cdot x_{66} +$
$k_{-64} \cdot x_{98} - k_{64} \cdot x_{83} \cdot x_{24} + k_{-64} \cdot x_{102} - k_{65} \cdot x_{83} \cdot x_{100} + k_{-65} \cdot x_{96} - k_{65} \cdot x_{83} \cdot x_{420} + k_{-65} \cdot x_{98} - k_{65} \cdot x_{83} \cdot x_{103} +$
$k_{-65} \cdot x_{102} - k_{110} \cdot x_{83} \cdot x_{486} + k_{-110} \cdot x_{432} - k_{110} \cdot x_{83} \cdot x_{445} + k_{-110} \cdot x_{434} - k_{110} \cdot x_{83} \cdot x_{446} + k_{-110} \cdot x_{437} - k_{110} \cdot$
$x_{83} \cdot x_{447} + k_{-110} \cdot x_{440} - k_{110} \cdot x_{83} \cdot x_{454} + k_{-110} \cdot x_{475} - k_{110} \cdot x_{83} \cdot x_{457} + k_{-110} \cdot x_{478} - k_{110} \cdot x_{83} \cdot x_{460} + k_{-110} \cdot$
$x_{481} - k_{111} \cdot x_{83} \cdot x_{491} + k_{-111} \cdot x_{478} - k_{111} \cdot x_{83} \cdot x_{490} + k_{-111} \cdot x_{475} - k_{111} \cdot x_{83} \cdot x_{410} + k_{-111} \cdot x_{440} - k_{111} \cdot x_{83} \cdot$
$x_{409} + k_{-111} \cdot x_{437} - k_{111} \cdot x_{83} \cdot x_{430} + k_{-111} \cdot x_{434} - k_{111} \cdot x_{83} \cdot x_{488} + k_{-111} \cdot x_{432} - k_{111} \cdot x_{83} \cdot x_{487} + k_{-111} \cdot x_{481}$
(83) $\dot{x}_{84} = +k_{56} \cdot x_{83} \cdot x_{60} - k_{-56} \cdot x_{84} + k_{57} \cdot x_{81} \cdot x_{60} - k_{-57} \cdot x_{84}$
(84) $\dot{x}_{85} = +k_{57} \cdot x_{55} \cdot x_{60} - k_{-57} \cdot x_{85} + k_{58} \cdot x_{60} \cdot x_{81} - k_{-58} \cdot x_{85}$
(85) $\dot{x}_{87} = -k_{96} \cdot x_{87} \cdot x_{87} + k_{-96} \cdot x_{289} - k_{96} \cdot x_{87} \cdot x_{87} + k_{-96} \cdot x_{289} - k_{102} \cdot x_{87} \cdot x_{330} + k_{-102} \cdot x_{148} - k_{103} \cdot x_{87} \cdot$
$x_{141} + k_{-103} \cdot x_{284} - k_{103} \cdot x_{87} \cdot x_{331} + k_{-103} \cdot x_{335} - k_{103} \cdot x_{87} \cdot x_{332} + k_{-103} \cdot x_{336} - k_{103} \cdot x_{87} \cdot x_{502} + k_{-103} \cdot x_{509}$
(86) $\dot{x}_{88} = +k_{4} \cdot x_{25} \cdot x_{12} - k_{-4} \cdot x_{88} + k_{5} \cdot x_{9} \cdot x_{19} - k_{-5} \cdot x_{88}$
(87) $\dot{x}_{89} = +k_{4} \cdot x_{27} \cdot x_{12} - k_{-4} \cdot x_{89} + k_{5} \cdot x_{9} \cdot x_{20} - k_{-5} \cdot x_{89}$
(88) $\dot{x}_{90} = +k_{4} \cdot x_{29} \cdot x_{12} - k_{-4} \cdot x_{90} + k_{5} \cdot x_{9} \cdot x_{21} - k_{-5} \cdot x_{90}$

(89) $\dot{x}_{91} = +k_4 \cdot x_{34} \cdot x_{12} - k_{-4} \cdot x_{91} + k_5 \cdot x_9 \cdot x_{65} - k_{-5} \cdot x_{91}$
(90) $\dot{x}_{92} = +k_4 \cdot x_{35} \cdot x_{12} - k_{-4} \cdot x_{92} + k_5 \cdot x_9 \cdot x_{66} - k_{-5} \cdot x_{92}$
(91) $\dot{x}_{93} = +k_4 \cdot x_{36} \cdot x_{12} - k_{-4} \cdot x_{93} + k_5 \cdot x_9 \cdot x_{67} - k_{-5} \cdot x_{93}$
(92) $\dot{x}_{94} = +k_4 \cdot x_{37} \cdot x_{12} - k_{-4} \cdot x_{94} + k_5 \cdot x_{68} \cdot x_9 - k_{-5} \cdot x_{94}$
(93) $\dot{x}_{95} = +k_{64} \cdot x_{59} \cdot x_{25} - k_{-64} \cdot x_{95} + k_{65} \cdot x_{59} \cdot x_{99} - k_{-65} \cdot x_{95}$
(94) $\dot{x}_{96} = +k_{64} \cdot x_{83} \cdot x_{19} - k_{-64} \cdot x_{96} + k_{65} \cdot x_{83} \cdot x_{100} - k_{-65} \cdot x_{96}$
(95) $\dot{x}_{97} = +k_{64} \cdot x_{59} \cdot x_{35} - k_{-64} \cdot x_{97} + k_{65} \cdot x_{59} \cdot x_{419} - k_{-65} \cdot x_{97}$
(96) $\dot{x}_{98} = +k_{64} \cdot x_{83} \cdot x_{66} - k_{-64} \cdot x_{98} + k_{65} \cdot x_{83} \cdot x_{420} - k_{-65} \cdot x_{98}$
(97) $\dot{x}_{99} = -k_{65} \cdot x_{59} \cdot x_{99} + k_{-65} \cdot x_{95} + k_{101} \cdot x_{103} \cdot x_{23} - k_{-101} \cdot x_{99}$
(98) $\dot{x}_{100} = -k_{65} \cdot x_{83} \cdot x_{100} + k_{-65} \cdot x_{96} + k_{101} \cdot x_{103} \cdot x_{18} - k_{-101} \cdot x_{100}$
(99) $\dot{x}_{101} = +k_{64} \cdot x_{59} \cdot x_{24} - k_{-64} \cdot x_{101} + k_{65} \cdot x_{59} \cdot x_{103} - k_{-65} \cdot x_{101}$
(100) $\dot{x}_{102} = +k_{64} \cdot x_{83} \cdot x_{24} - k_{-64} \cdot x_{102} + k_{65} \cdot x_{83} \cdot x_{103} - k_{-65} \cdot x_{102}$
(101) $\dot{x}_{103} = -k_{65} \cdot x_{59} \cdot x_{103} + k_{-65} \cdot x_{101} - k_{65} \cdot x_{83} \cdot x_{103} + k_{-65} \cdot x_{102} - k_{101} \cdot x_{103} \cdot x_{23} + k_{-101} \cdot x_{99} - k_{101} \cdot x_{103} \cdot x_{18} + k_{-101} \cdot x_{100} - k_{101} \cdot x_{103} \cdot x_{34} + k_{-101} \cdot x_{419} - k_{101} \cdot x_{103} \cdot x_{65} + k_{-101} \cdot x_{420}$
(102) $\dot{x}_{104} = +k_{66} \cdot x_{287} \cdot x_{486} - k_{-66} \cdot x_{104} - k_{68} \cdot x_{104} \cdot x_{106} + k_{-68} \cdot x_{448} - k_{106b} \cdot x_{444} \cdot x_{104} + k_{-106b} \cdot x_{448} - k_{112} \cdot x_{26} \cdot x_{104} + k_{-112} \cdot x_{264} - k_{113} \cdot x_{28} \cdot x_{104} + k_{-113} \cdot x_{264}$
(103) $\dot{x}_{105} = -k_{122} \cdot x_{427} \cdot x_{105} + k_{-122} \cdot x_{130} - k_{122} \cdot x_{428} \cdot x_{105} + k_{-122} \cdot x_{131} - k_{122} \cdot x_{429} \cdot x_{105} + k_{-122} \cdot x_{132} - k_{122} \cdot x_{436} \cdot x_{105} + k_{-122} \cdot x_{133} - k_{122} \cdot x_{439} \cdot x_{105} + k_{-122} \cdot x_{134} - k_{122} \cdot x_{442} \cdot x_{105} + k_{-122} \cdot x_{135} - k_{122} \cdot x_{483} \cdot x_{105} + k_{-122} \cdot x_{136} - k_{123} \cdot x_{445} \cdot x_{105} + k_{-123} \cdot x_{130} - k_{123} \cdot x_{446} \cdot x_{105} + k_{-123} \cdot x_{131} - k_{123} \cdot x_{447} \cdot x_{105} + k_{-123} \cdot x_{132} - k_{123} \cdot x_{454} \cdot x_{105} + k_{-123} \cdot x_{133} - k_{123} \cdot x_{457} \cdot x_{105} + k_{-123} \cdot x_{134} - k_{123} \cdot x_{460} \cdot x_{105} + k_{-123} \cdot x_{135} - k_{123} \cdot x_{486} \cdot x_{105} + k_{-123} \cdot x_{136} - k_{122} \cdot x_{531} \cdot x_{105} + k_{-122} \cdot x_2 - k_{122m} \cdot x_{532} \cdot x_{105} + k_{-122} \cdot x_{524} + k_{124} \cdot x_{532} - k_{-124} \cdot x_{105} + k_{124} \cdot x_{532} - k_{-124} \cdot x_{105} + k_{124} \cdot x_{532} - k_{-124} \cdot x_{105} + k_{124} \cdot x_{532} - k_{-124} \cdot x_{105} + k_{124} \cdot x_{532} - k_{-124} \cdot x_{105} + k_{124} \cdot x_{532} - k_{-124} \cdot x_{105} + k_{124} \cdot x_{532} - k_{-124} \cdot x_{105} + k_{124} \cdot x_{532} - k_{-124} \cdot x_{105} + k_{124} \cdot x_{532} - k_{-124} \cdot x_{105} + k_{124} \cdot x_{532} - k_{-124} \cdot x_{105} + k_{124} \cdot x_{532} - k_{-124} \cdot x_{105} + k_{124} \cdot x_{532} - k_{-124} \cdot x_{105} + k_{124} \cdot x_{532} - k_{-124} \cdot x_{105} + k_{124} \cdot x_{532} - k_{-124} \cdot x_{105} + k_{124} \cdot x_{532} - k_{-124} \cdot x_{105} + k_{124} \cdot x_{532} - k_{-124} \cdot x_{105} + k_{124} \cdot x_{532} - k_{-124} \cdot x_{105}$
(104) $\dot{x}_{106} = -k_{68} \cdot x_{106} \cdot x_{405} + k_{-68b} \cdot x_{453} - k_{68} \cdot x_{106} \cdot x_{324} + k_{-68} \cdot x_{452} - k_{68} \cdot x_{104} \cdot x_{106} + k_{-68} \cdot x_{448} - k_{68} \cdot x_{106} \cdot x_{261} + k_{-68} \cdot x_{449} - k_{68} \cdot x_{106} \cdot x_{262} + k_{-68} \cdot x_{450} - k_{68} \cdot x_{106} \cdot x_{263} + k_{-68} \cdot x_{451} - k_{68} \cdot x_{106} \cdot x_{453} + k_{-68b} \cdot x_{467} - k_{68} \cdot x_{106} \cdot x_{467} + k_{-68b} \cdot x_{468} - k_{68} \cdot x_{106} \cdot x_{468} + k_{-68b} \cdot x_{469} - k_{68} \cdot x_{106} \cdot x_{469} + k_{-68b} \cdot x_{470} - k_{68} \cdot x_{106} \cdot x_{470} + k_{-68b} \cdot x_{471} - k_{69} \cdot x_{106} \cdot x_{107} + k_{-69} \cdot x_{108} - k_{69} \cdot x_{106} \cdot x_{112} + k_{-69} \cdot x_{495} - k_{76} \cdot x_{109} \cdot x_{106} + k_{-76} \cdot x_{111} - k_{109} \cdot x_{106} \cdot x_{279} + k_{-109} \cdot x_{482} - k_{109} \cdot x_{106} \cdot x_{461} + k_{-109} \cdot x_{462}$
(105) $\dot{x}_{107} = -k_{69} \cdot x_{106} \cdot x_{107} + k_{-69} \cdot x_{108} - k_{75} \cdot x_{107} \cdot x_{113} + k_{-75} \cdot x_{114}$
(106) $\dot{x}_{108} = +k_{69} \cdot x_{106} \cdot x_{107} - k_{-69} \cdot x_{108} - k_{70} \cdot x_{109} \cdot x_{108} + k_{-70} \cdot x_{110}$
(107) $\dot{x}_{109} = -k_{70} \cdot x_{109} \cdot x_{495} + k_{-70} \cdot x_{496} - k_{70} \cdot x_{109} \cdot x_{108} + k_{-70} \cdot x_{110} - k_{76} \cdot x_{109} \cdot x_{106} + k_{-76} \cdot x_{111}$
(108) $\dot{x}_{110} = +k_{70} \cdot x_{109} \cdot x_{108} - k_{-70} \cdot x_{110} + k_{71} \cdot x_{111} \cdot x_{112} - k_{-71} \cdot x_{110}$
(109) $\dot{x}_{111} = -k_{71} \cdot x_{111} \cdot x_{112} + k_{-71} \cdot x_{110} - k_{72} \cdot x_{497} \cdot x_{111} + k_{-72} \cdot x_{496} + k_{76} \cdot x_{109} \cdot x_{106} - k_{-76} \cdot x_{111}$
(110) $\dot{x}_{112} = -k_{69} \cdot x_{106} \cdot x_{112} + k_{-69} \cdot x_{495} - k_{71} \cdot x_{111} \cdot x_{112} + k_{-71} \cdot x_{110} - k_{73} \cdot x_{112} \cdot x_{113} + k_{-73} \cdot x_{114} - k_{75} \cdot x_{112} \cdot x_{113} + k_{-75} \cdot x_{498}$
(111) $\dot{x}_{113} = -k_{74} \cdot x_{497} \cdot x_{113} + k_{-74} \cdot x_{498} - k_{73} \cdot x_{112} \cdot x_{113} + k_{-73} \cdot x_{114} - k_{75} \cdot x_{107} \cdot x_{113} + k_{-75} \cdot x_{114} - k_{75} \cdot x_{112} \cdot x_{113} + k_{-75} \cdot x_{498}$
(112) $\dot{x}_{114} = +k_{73} \cdot x_{112} \cdot x_{113} - k_{-73} \cdot x_{114} + k_{75} \cdot x_{107} \cdot x_{113} - k_{-75} \cdot x_{114}$
(113) $\dot{x}_{117} = -k_{1-} \cdot x_{117} \cdot x_1 + k_{-1-} \cdot x_{336} + k_{103} \cdot x_{141} \cdot x_{143} - k_{-103} \cdot x_{117}$
(114) $\dot{x}_{130} = +k_{122} \cdot x_{427} \cdot x_{105} - k_{-122} \cdot x_{130} + k_{123} \cdot x_{445} \cdot x_{105} - k_{-123} \cdot x_{130}$
(115) $\dot{x}_{131} = +k_{122} \cdot x_{428} \cdot x_{105} - k_{-122} \cdot x_{131} + k_{123} \cdot x_{446} \cdot x_{105} - k_{-123} \cdot x_{131}$
(116) $\dot{x}_{132} = +k_{122} \cdot x_{429} \cdot x_{105} - k_{-122} \cdot x_{132} + k_{123} \cdot x_{447} \cdot x_{105} - k_{-123} \cdot x_{132}$
(117) $\dot{x}_{133} = +k_{122} \cdot x_{436} \cdot x_{105} - k_{-122} \cdot x_{133} + k_{123} \cdot x_{454} \cdot x_{105} - k_{-123} \cdot x_{133}$
(118) $\dot{x}_{134} = +k_{122} \cdot x_{439} \cdot x_{105} - k_{-122} \cdot x_{134} + k_{123} \cdot x_{457} \cdot x_{105} - k_{-123} \cdot x_{134}$

(119) $\dot{x}_{135} = +k_{122} \cdot x_{442} \cdot x_{105} - k_{-122} \cdot x_{135} + k_{123} \cdot x_{460} \cdot x_{105} - k_{-123} \cdot x_{135}$
(120) $\dot{x}_{136} = +k_{122} \cdot x_{483} \cdot x_{105} - k_{-122} \cdot x_{136} + k_{123} \cdot x_{486} \cdot x_{105} - k_{-123} \cdot x_{136}$
(121) $\dot{x}_{140} = -k_{2b} \cdot x_3 \cdot x_{140} + k_{-2b} \cdot x_{146} - k_{2b} \cdot x_{140} \cdot x_{499} + k_{-2b} \cdot x_{493} - k_{100} \cdot x_{140} \cdot x_{285} + k_{-100} \cdot x_{506} - k_{103} \cdot x_{141} \cdot x_{140} + k_{-103} \cdot x_{288} - k_{103} \cdot x_{502} \cdot x_{140} + k_{-103} \cdot x_{510} - k_{119} \cdot x_{514} \cdot x_{140} + k_{-119} \cdot x_{142}$
(122) $\dot{x}_{141} = -k_{2b} \cdot x_3 \cdot x_{141} + k_{-2b} \cdot x_{145} - k_{2b} \cdot x_{499} \cdot x_{141} + k_{-2b} \cdot x_{492} - k_{98} \cdot x_{141} \cdot x_{285} + k_{-98} \cdot x_{502} - k_{103} \cdot x_{87} \cdot x_{141} + k_{-103} \cdot x_{284} - k_{103} \cdot x_{141} \cdot x_{140} + k_{-103} \cdot x_{288} - k_{103} \cdot x_{141} \cdot x_{143} + k_{-103} \cdot x_{117} - k_{103} \cdot x_{141} \cdot x_{503} + k_{-103} \cdot x_{513} - k_{120} \cdot x_{142} \cdot x_{141} + k_{-120} \cdot x_{355} - k_{120} \cdot x_{141} \cdot x_{144} + k_{-120} \cdot x_{345}$
(123) $\dot{x}_{142} = +k_{119} \cdot x_{514} \cdot x_{140} - k_{-119} \cdot x_{142} - k_{120} \cdot x_{142} \cdot x_{141} + k_{-120} \cdot x_{355} - k_{120b} \cdot x_{142} \cdot x_2 + k_{-120} \cdot x_{516}$
(124) $\dot{x}_{143} = -k_{2b} \cdot x_{143} \cdot x_3 + k_{-2b} \cdot x_{147} - k_{2b} \cdot x_{143} \cdot x_{499} + k_{-2b} \cdot x_{494} - k_{99} \cdot x_{143} \cdot x_{285} + k_{-99} \cdot x_{503} - k_{103} \cdot x_{141} \cdot x_{143} + k_{-103} \cdot x_{117} - k_{103} \cdot x_{502} \cdot x_{143} + k_{-103} \cdot x_{511} - k_{119} \cdot x_{143} \cdot x_{514} + k_{-119} \cdot x_{144}$
(125) $\dot{x}_{144} = +k_{119} \cdot x_{143} \cdot x_{514} - k_{-119} \cdot x_{144} - k_{120} \cdot x_{141} \cdot x_{144} + k_{-120} \cdot x_{345} - k_{120b} \cdot x_{144} \cdot x_2 + k_{-120} \cdot x_{517}$
(126) $\dot{x}_{145} = +k_{2b} \cdot x_3 \cdot x_{141} - k_{-2b} \cdot x_{145}$
(127) $\dot{x}_{146} = +k_{2b} \cdot x_3 \cdot x_{140} - k_{-2b} \cdot x_{146}$
(128) $\dot{x}_{147} = +k_{2b} \cdot x_{143} \cdot x_3 - k_{-2b} \cdot x_{147}$
(129) $\dot{x}_{148} = -k_8 \cdot x_{148} \cdot x_{14} + k_{-8} \cdot x_{151} + k_{102} \cdot x_{87} \cdot x_{330} - k_{-102} \cdot x_{148}$
(130) $\dot{x}_{149} = -k_{8b} \cdot x_{149} \cdot x_{14} + k_{-8b} \cdot x_{152} + k_{102} \cdot x_{330} \cdot x_{331} - k_{-102} \cdot x_{149}$
(131) $\dot{x}_{150} = -k_{8b} \cdot x_{150} \cdot x_{14} + k_{-8b} \cdot x_{153} + k_{102} \cdot x_{330} \cdot x_{332} - k_{-102} \cdot x_{150}$
(132) $\dot{x}_{151} = +k_8 \cdot x_{148} \cdot x_{14} - k_{-8} \cdot x_{151} - k_{16} \cdot x_{22} \cdot x_{151} + k_{-24} \cdot x_{225} - k_{22} \cdot x_{31} \cdot x_{151} + k_{-22b} \cdot x_{171} - k_{32} \cdot x_{151} \cdot x_{38} + k_{-32} \cdot x_{198} - k_{34} \cdot x_{151} \cdot x_{30} + k_{-34} \cdot x_{234} - k_{37} \cdot x_{151} \cdot x_{40} + k_{-37} \cdot x_{180} - k_{37} \cdot x_{151} \cdot x_{39} + k_{-37} \cdot x_{189}$
(133) $\dot{x}_{152} = +k_{8b} \cdot x_{149} \cdot x_{14} - k_{-8b} \cdot x_{152} - k_{16} \cdot x_{22} \cdot x_{152} + k_{-24} \cdot x_{226} - k_{22} \cdot x_{31} \cdot x_{152} + k_{-22b} \cdot x_{172} - k_{32} \cdot x_{152} \cdot x_{38} + k_{-32} \cdot x_{199} - k_{34} \cdot x_{152} \cdot x_{30} + k_{-34} \cdot x_{235} - k_{37} \cdot x_{152} \cdot x_{40} + k_{-37} \cdot x_{181} - k_{37} \cdot x_{152} \cdot x_{39} + k_{-37} \cdot x_{190}$
(134) $\dot{x}_{153} = +k_{8b} \cdot x_{150} \cdot x_{14} - k_{-8b} \cdot x_{153} - k_{16} \cdot x_{22} \cdot x_{153} + k_{-24} \cdot x_{227} - k_{22} \cdot x_{31} \cdot x_{153} + k_{-22b} \cdot x_{173} - k_{32} \cdot x_{153} \cdot x_{38} + k_{-32} \cdot x_{200} - k_{34} \cdot x_{153} \cdot x_{30} + k_{-34} \cdot x_{236} - k_{37} \cdot x_{153} \cdot x_{40} + k_{-37} \cdot x_{182} - k_{37} \cdot x_{153} \cdot x_{39} + k_{-37} \cdot x_{191}$
(135) $\dot{x}_{154} = -k_{2b} \cdot x_{10} \cdot x_{154} + k_{-2b} \cdot x_{160} - k_{10b} \cdot x_{154} \cdot x_{515} + k_{-10} \cdot x_{157} - k_{15} \cdot x_{154} + k_{-15} \cdot x_{515}$
(136) $\dot{x}_{155} = -k_{2b} \cdot x_{10} \cdot x_{155} + k_{-2b} \cdot x_{159} - k_{120} \cdot x_{157} \cdot x_{155} + k_{-120} \cdot x_{421} - k_{120} \cdot x_{155} \cdot x_{158} + k_{-120} \cdot x_{422}$
(137) $\dot{x}_{156} = -k_{2b} \cdot x_{10} \cdot x_{156} + k_{-2b} \cdot x_{161}$
(138) $\dot{x}_{157} = +k_{10b} \cdot x_{154} \cdot x_{515} - k_{-10} \cdot x_{157} - k_{120} \cdot x_{157} \cdot x_{155} + k_{-120} \cdot x_{421} - k_{120b} \cdot x_6 \cdot x_{157} + k_{-120} \cdot x_{518}$
(139) $\dot{x}_{158} = -k_{120} \cdot x_{155} \cdot x_{158} + k_{-120} \cdot x_{422} - k_{120b} \cdot x_6 \cdot x_{158} + k_{-120} \cdot x_{519}$
(140) $\dot{x}_{159} = +k_{2b} \cdot x_{10} \cdot x_{155} - k_{-2b} \cdot x_{159} - k_{95} \cdot x_{280} \cdot x_{159} + k_{-95} \cdot x_{416}$
(141) $\dot{x}_{160} = +k_{2b} \cdot x_{10} \cdot x_{154} - k_{-2b} \cdot x_{160} - k_{95} \cdot x_{280} \cdot x_{160} + k_{-95} \cdot x_{281}$
(142) $\dot{x}_{161} = +k_{2b} \cdot x_{10} \cdot x_{156} - k_{-2b} \cdot x_{161} - k_{95} \cdot x_{280} \cdot x_{161} + k_{-95} \cdot x_{282}$
(143) $\dot{x}_{162} = -k_{8b} \cdot x_{162} \cdot x_{14} + k_{-8b} \cdot x_{165} - k_{94} \cdot x_{280} \cdot x_{162} + k_{-94} \cdot x_{416}$
(144) $\dot{x}_{163} = -k_{8b} \cdot x_{163} \cdot x_{14} + k_{-8b} \cdot x_{166} - k_{94b} \cdot x_{280} \cdot x_{163} + k_{-94} \cdot x_{281}$
(145) $\dot{x}_{164} = -k_{8b} \cdot x_{164} \cdot x_{14} + k_{-8b} \cdot x_{167} - k_{94b} \cdot x_{280} \cdot x_{164} + k_{-94} \cdot x_{282}$
(146) $\dot{x}_{165} = +k_{8b} \cdot x_{162} \cdot x_{14} - k_{-8b} \cdot x_{165} - k_{16} \cdot x_{165} \cdot x_{22} + k_{-24} \cdot x_{228} - k_{22} \cdot x_{31} \cdot x_{165} + k_{-22b} \cdot x_{174} - k_{32} \cdot x_{165} \cdot x_{38} + k_{-32} \cdot x_{201} - k_{34} \cdot x_{165} \cdot x_{30} + k_{-34} \cdot x_{237} - k_{37} \cdot x_{165} \cdot x_{40} + k_{-37} \cdot x_{183} - k_{37} \cdot x_{165} \cdot x_{39} + k_{-37} \cdot x_{192}$
(147) $\dot{x}_{166} = +k_{8b} \cdot x_{163} \cdot x_{14} - k_{-8b} \cdot x_{166} - k_{16} \cdot x_{166} \cdot x_{22} + k_{-24} \cdot x_{229} - k_{22} \cdot x_{31} \cdot x_{166} + k_{-22b} \cdot x_{175} - k_{32} \cdot x_{166} \cdot x_{38} + k_{-32} \cdot x_{202} - k_{34} \cdot x_{166} \cdot x_{30} + k_{-34} \cdot x_{238} - k_{37} \cdot x_{166} \cdot x_{40} + k_{-37} \cdot x_{184} - k_{37} \cdot x_{166} \cdot x_{39} + k_{-37} \cdot x_{193}$
(148) $\dot{x}_{167} = +k_{8b} \cdot x_{164} \cdot x_{14} - k_{-8b} \cdot x_{167} - k_{16} \cdot x_{167} \cdot x_{22} + k_{-24} \cdot x_{230} - k_{22} \cdot x_{31} \cdot x_{167} + k_{-22b} \cdot x_{176} - k_{32} \cdot x_{167} \cdot x_{38} + k_{-32} \cdot x_{203} - k_{34} \cdot x_{167} \cdot x_{30} + k_{-34} \cdot x_{239} - k_{37} \cdot x_{167} \cdot x_{40} + k_{-37} \cdot x_{185} - k_{37} \cdot x_{167} \cdot x_{39} + k_{-37} \cdot x_{194}$
(149) $\dot{x}_{171} = +k_{22} \cdot x_{31} \cdot x_{151} - k_{-22b} \cdot x_{171}$
(150) $\dot{x}_{172} = +k_{22} \cdot x_{31} \cdot x_{152} - k_{-22b} \cdot x_{172}$
(151) $\dot{x}_{173} = +k_{22} \cdot x_{31} \cdot x_{153} - k_{-22b} \cdot x_{173}$
(152) $\dot{x}_{174} = +k_{22} \cdot x_{31} \cdot x_{165} - k_{-22b} \cdot x_{174}$
(153) $\dot{x}_{175} = +k_{22} \cdot x_{31} \cdot x_{166} - k_{-22b} \cdot x_{175}$
(154) $\dot{x}_{176} = +k_{22} \cdot x_{31} \cdot x_{167} - k_{-22b} \cdot x_{176}$

(155) $\dot{x}_{180} = -k_{16} \cdot x_{22} \cdot x_{180} + k_{-24} \cdot x_{189} + k_{37} \cdot x_{151} \cdot x_{40} - k_{-37} \cdot x_{180} - k_{41} \cdot x_{30} \cdot x_{180} + k_{-41} \cdot x_{198}$
(156) $\dot{x}_{181} = -k_{16} \cdot x_{22} \cdot x_{181} + k_{-24} \cdot x_{190} + k_{37} \cdot x_{152} \cdot x_{40} - k_{-37} \cdot x_{181} - k_{41} \cdot x_{30} \cdot x_{181} + k_{-41} \cdot x_{199}$
(157) $\dot{x}_{182} = -k_{16} \cdot x_{22} \cdot x_{182} + k_{-24} \cdot x_{191} + k_{37} \cdot x_{153} \cdot x_{40} - k_{-37} \cdot x_{182} - k_{41} \cdot x_{30} \cdot x_{182} + k_{-41} \cdot x_{200}$
(158) $\dot{x}_{183} = -k_{16} \cdot x_{22} \cdot x_{183} + k_{-24} \cdot x_{192} + k_{37} \cdot x_{165} \cdot x_{40} - k_{-37} \cdot x_{183} - k_{41} \cdot x_{30} \cdot x_{183} + k_{-41} \cdot x_{201}$
(159) $\dot{x}_{184} = -k_{16} \cdot x_{22} \cdot x_{184} + k_{-24} \cdot x_{193} + k_{37} \cdot x_{166} \cdot x_{40} - k_{-37} \cdot x_{184} - k_{41} \cdot x_{30} \cdot x_{184} + k_{-41} \cdot x_{202}$
(160) $\dot{x}_{185} = -k_{16} \cdot x_{22} \cdot x_{185} + k_{-24} \cdot x_{194} + k_{37} \cdot x_{167} \cdot x_{40} - k_{-37} \cdot x_{185} - k_{41} \cdot x_{30} \cdot x_{185} + k_{-41} \cdot x_{203}$
(161) $\dot{x}_{189} = -k_{4b} \cdot x_{189} \cdot x_{12} + k_{-4} \cdot x_{195} + k_{16} \cdot x_{22} \cdot x_{180} - k_{-24} \cdot x_{189} - k_{25} \cdot x_{24} \cdot x_{189} + k_{-25} \cdot x_{198} + k_{37} \cdot x_{151} \cdot x_{39} - k_{-37} \cdot x_{189}$
(162) $\dot{x}_{190} = -k_{4b} \cdot x_{190} \cdot x_{12} + k_{-4} \cdot x_{196} + k_{16} \cdot x_{22} \cdot x_{181} - k_{-24} \cdot x_{190} - k_{25} \cdot x_{24} \cdot x_{190} + k_{-25} \cdot x_{199} + k_{37} \cdot x_{152} \cdot x_{39} - k_{-37} \cdot x_{190}$
(163) $\dot{x}_{191} = -k_{4b} \cdot x_{191} \cdot x_{12} + k_{-4} \cdot x_{197} + k_{16} \cdot x_{22} \cdot x_{182} - k_{-24} \cdot x_{191} - k_{25} \cdot x_{24} \cdot x_{191} + k_{-25} \cdot x_{200} + k_{37} \cdot x_{153} \cdot x_{39} - k_{-37} \cdot x_{191}$
(164) $\dot{x}_{192} = -k_{5} \cdot x_{9} \cdot x_{192} + k_{-5b} \cdot x_{195} + k_{16} \cdot x_{22} \cdot x_{183} - k_{-24} \cdot x_{192} - k_{25} \cdot x_{24} \cdot x_{192} + k_{-25} \cdot x_{201} + k_{37} \cdot x_{165} \cdot x_{39} - k_{-37} \cdot x_{192}$
(165) $\dot{x}_{193} = -k_{5} \cdot x_{9} \cdot x_{193} + k_{-5b} \cdot x_{196} + k_{16} \cdot x_{22} \cdot x_{184} - k_{-24} \cdot x_{193} - k_{25} \cdot x_{24} \cdot x_{193} + k_{-25} \cdot x_{202} + k_{37} \cdot x_{166} \cdot x_{39} - k_{-37} \cdot x_{193}$
(166) $\dot{x}_{194} = -k_{5} \cdot x_{9} \cdot x_{194} + k_{-5b} \cdot x_{197} + k_{16} \cdot x_{22} \cdot x_{185} - k_{-24} \cdot x_{194} - k_{25} \cdot x_{24} \cdot x_{194} + k_{-25} \cdot x_{203} + k_{37} \cdot x_{167} \cdot x_{39} - k_{-37} \cdot x_{194}$
(167) $\dot{x}_{195} = +k_{4b} \cdot x_{189} \cdot x_{12} - k_{-4} \cdot x_{195} + k_{5} \cdot x_{9} \cdot x_{192} - k_{-5b} \cdot x_{195}$
(168) $\dot{x}_{196} = +k_{4b} \cdot x_{190} \cdot x_{12} - k_{-4} \cdot x_{196} + k_{5} \cdot x_{9} \cdot x_{193} - k_{-5b} \cdot x_{196}$
(169) $\dot{x}_{197} = +k_{4b} \cdot x_{191} \cdot x_{12} - k_{-4} \cdot x_{197} + k_{5} \cdot x_{9} \cdot x_{194} - k_{-5b} \cdot x_{197}$
(170) $\dot{x}_{198} = -k_{4b} \cdot x_{198} \cdot x_{12} + k_{-4} \cdot x_{204} - k_{18} \cdot x_{26} \cdot x_{198} + k_{-18} \cdot x_{207} - k_{19} \cdot x_{198} \cdot x_{28} + k_{-19} \cdot x_{207} - k_{20} \cdot x_{43} \cdot x_{198} + k_{-20} \cdot x_{216} - k_{21} \cdot x_{198} \cdot x_{26} + k_{-21} \cdot x_{216} + k_{25} \cdot x_{24} \cdot x_{189} - k_{-25} \cdot x_{198} + k_{32} \cdot x_{151} \cdot x_{38} - k_{-32} \cdot x_{198} + k_{41} \cdot x_{30} \cdot x_{180} - k_{-41} \cdot x_{198}$
(171) $\dot{x}_{199} = -k_{4b} \cdot x_{199} \cdot x_{12} + k_{-4} \cdot x_{205} - k_{18} \cdot x_{26} \cdot x_{199} + k_{-18} \cdot x_{208} - k_{19} \cdot x_{199} \cdot x_{28} + k_{-19} \cdot x_{208} - k_{20} \cdot x_{43} \cdot x_{199} + k_{-20} \cdot x_{217} - k_{21} \cdot x_{199} \cdot x_{26} + k_{-21} \cdot x_{217} + k_{25} \cdot x_{24} \cdot x_{190} - k_{-25} \cdot x_{199} + k_{32} \cdot x_{152} \cdot x_{38} - k_{-32} \cdot x_{199} + k_{41} \cdot x_{30} \cdot x_{181} - k_{-41} \cdot x_{199}$
(172) $\dot{x}_{200} = -k_{4b} \cdot x_{200} \cdot x_{12} + k_{-4} \cdot x_{206} - k_{18} \cdot x_{26} \cdot x_{200} + k_{-18} \cdot x_{209} - k_{19} \cdot x_{200} \cdot x_{28} + k_{-19} \cdot x_{209} - k_{20} \cdot x_{43} \cdot x_{200} + k_{-20} \cdot x_{218} - k_{21} \cdot x_{200} \cdot x_{26} + k_{-21} \cdot x_{218} + k_{25} \cdot x_{24} \cdot x_{191} - k_{-25} \cdot x_{200} + k_{32} \cdot x_{153} \cdot x_{38} - k_{-32} \cdot x_{200} + k_{41} \cdot x_{30} \cdot x_{182} - k_{-41} \cdot x_{200}$
(173) $\dot{x}_{201} = -k_{5} \cdot x_{9} \cdot x_{201} + k_{-5b} \cdot x_{204} - k_{18} \cdot x_{26} \cdot x_{201} + k_{-18} \cdot x_{210} - k_{19} \cdot x_{201} \cdot x_{69} + k_{-19} \cdot x_{210} - k_{20} \cdot x_{71} \cdot x_{201} + k_{-20} \cdot x_{219} - k_{21} \cdot x_{201} \cdot x_{26} + k_{-21} \cdot x_{219} + k_{25} \cdot x_{24} \cdot x_{192} - k_{-25} \cdot x_{201} + k_{32} \cdot x_{165} \cdot x_{38} - k_{-32} \cdot x_{201} + k_{41} \cdot x_{30} \cdot x_{183} - k_{-41} \cdot x_{201}$
(174) $\dot{x}_{202} = -k_{5} \cdot x_{9} \cdot x_{202} + k_{-5b} \cdot x_{205} - k_{18} \cdot x_{26} \cdot x_{202} + k_{-18} \cdot x_{211} - k_{19} \cdot x_{202} \cdot x_{69} + k_{-19} \cdot x_{211} - k_{20} \cdot x_{71} \cdot x_{202} + k_{-20} \cdot x_{220} - k_{21} \cdot x_{202} \cdot x_{26} + k_{-21} \cdot x_{220} + k_{25} \cdot x_{24} \cdot x_{193} - k_{-25} \cdot x_{202} + k_{32} \cdot x_{166} \cdot x_{38} - k_{-32} \cdot x_{202} + k_{41} \cdot x_{30} \cdot x_{184} - k_{-41} \cdot x_{202}$
(175) $\dot{x}_{203} = -k_{5} \cdot x_{9} \cdot x_{203} + k_{-5b} \cdot x_{206} - k_{18} \cdot x_{26} \cdot x_{203} + k_{-18} \cdot x_{212} - k_{19} \cdot x_{203} \cdot x_{69} + k_{-19} \cdot x_{212} - k_{20} \cdot x_{71} \cdot x_{203} + k_{-20} \cdot x_{221} - k_{21} \cdot x_{203} \cdot x_{26} + k_{-21} \cdot x_{221} + k_{25} \cdot x_{24} \cdot x_{194} - k_{-25} \cdot x_{203} + k_{32} \cdot x_{167} \cdot x_{38} - k_{-32} \cdot x_{203} + k_{41} \cdot x_{30} \cdot x_{185} - k_{-41} \cdot x_{203}$
(176) $\dot{x}_{204} = +k_{4b} \cdot x_{198} \cdot x_{12} - k_{-4} \cdot x_{204} + k_{5} \cdot x_{9} \cdot x_{201} - k_{-5b} \cdot x_{204}$
(177) $\dot{x}_{205} = +k_{4b} \cdot x_{199} \cdot x_{12} - k_{-4} \cdot x_{205} + k_{5} \cdot x_{9} \cdot x_{202} - k_{-5b} \cdot x_{205}$
(178) $\dot{x}_{206} = +k_{4b} \cdot x_{200} \cdot x_{12} - k_{-4} \cdot x_{206} + k_{5} \cdot x_{9} \cdot x_{203} - k_{-5b} \cdot x_{206}$
(179) $\dot{x}_{207} = -k_{4b} \cdot x_{207} \cdot x_{12} + k_{-4} \cdot x_{213} + k_{18} \cdot x_{26} \cdot x_{198} - k_{-18} \cdot x_{207} + k_{19} \cdot x_{198} \cdot x_{28} - k_{-19} \cdot x_{207}$
(180) $\dot{x}_{208} = -k_{4b} \cdot x_{208} \cdot x_{12} + k_{-4} \cdot x_{214} + k_{18} \cdot x_{26} \cdot x_{199} - k_{-18} \cdot x_{208} + k_{19} \cdot x_{199} \cdot x_{28} - k_{-19} \cdot x_{208}$
(181) $\dot{x}_{209} = -k_{4b} \cdot x_{209} \cdot x_{12} + k_{-4} \cdot x_{215} + k_{18} \cdot x_{26} \cdot x_{200} - k_{-18} \cdot x_{209} + k_{19} \cdot x_{200} \cdot x_{28} - k_{-19} \cdot x_{209}$
(182) $\dot{x}_{210} = -k_{5} \cdot x_{9} \cdot x_{210} + k_{-5b} \cdot x_{213} + k_{18} \cdot x_{26} \cdot x_{201} - k_{-18} \cdot x_{210} + k_{19} \cdot x_{201} \cdot x_{69} - k_{-19} \cdot x_{210}$

(183) $\dot{x}_{211} = -k_5 \cdot x_9 \cdot x_{211} + k_{-5b} \cdot x_{214} + k_{18} \cdot x_{26} \cdot x_{202} - k_{-18} \cdot x_{211} + k_{19} \cdot x_{202} \cdot x_{69} - k_{-19} \cdot x_{211}$
(184) $\dot{x}_{212} = -k_5 \cdot x_9 \cdot x_{212} + k_{-5b} \cdot x_{215} + k_{18} \cdot x_{26} \cdot x_{203} - k_{-18} \cdot x_{212} + k_{19} \cdot x_{203} \cdot x_{69} - k_{-19} \cdot x_{212}$
(185) $\dot{x}_{213} = +k_{4b} \cdot x_{207} \cdot x_{12} - k_{-4} \cdot x_{213} + k_5 \cdot x_9 \cdot x_{210} - k_{-5b} \cdot x_{213}$
(186) $\dot{x}_{214} = +k_{4b} \cdot x_{208} \cdot x_{12} - k_{-4} \cdot x_{214} + k_5 \cdot x_9 \cdot x_{211} - k_{-5b} \cdot x_{214}$
(187) $\dot{x}_{215} = +k_{4b} \cdot x_{209} \cdot x_{12} - k_{-4} \cdot x_{215} + k_5 \cdot x_9 \cdot x_{212} - k_{-5b} \cdot x_{215}$
(188) $\dot{x}_{216} = -k_{4b} \cdot x_{216} \cdot x_{12} + k_{-4} \cdot x_{222} + k_{20} \cdot x_{43} \cdot x_{198} - k_{-20} \cdot x_{216} + k_{21} \cdot x_{198} \cdot x_{26} - k_{-21} \cdot x_{216}$
(189) $\dot{x}_{217} = -k_{4b} \cdot x_{217} \cdot x_{12} + k_{-4} \cdot x_{223} + k_{20} \cdot x_{43} \cdot x_{199} - k_{-20} \cdot x_{217} + k_{21} \cdot x_{199} \cdot x_{26} - k_{-21} \cdot x_{217}$
(190) $\dot{x}_{218} = -k_{4b} \cdot x_{218} \cdot x_{12} + k_{-4} \cdot x_{224} + k_{20} \cdot x_{43} \cdot x_{200} - k_{-20} \cdot x_{218} + k_{21} \cdot x_{200} \cdot x_{26} - k_{-21} \cdot x_{218}$
(191) $\dot{x}_{219} = -k_5 \cdot x_9 \cdot x_{219} + k_{-5b} \cdot x_{222} + k_{20} \cdot x_{71} \cdot x_{201} - k_{-20} \cdot x_{219} + k_{21} \cdot x_{201} \cdot x_{26} - k_{-21} \cdot x_{219}$
(192) $\dot{x}_{220} = -k_5 \cdot x_9 \cdot x_{220} + k_{-5b} \cdot x_{223} + k_{20} \cdot x_{71} \cdot x_{202} - k_{-20} \cdot x_{220} + k_{21} \cdot x_{202} \cdot x_{26} - k_{-21} \cdot x_{220}$
(193) $\dot{x}_{221} = -k_5 \cdot x_9 \cdot x_{221} + k_{-5b} \cdot x_{224} + k_{20} \cdot x_{71} \cdot x_{203} - k_{-20} \cdot x_{221} + k_{21} \cdot x_{203} \cdot x_{26} - k_{-21} \cdot x_{221}$
(194) $\dot{x}_{222} = +k_{4b} \cdot x_{216} \cdot x_{12} - k_{-4} \cdot x_{222} + k_5 \cdot x_9 \cdot x_{219} - k_{-5b} \cdot x_{222}$
(195) $\dot{x}_{223} = +k_{4b} \cdot x_{217} \cdot x_{12} - k_{-4} \cdot x_{223} + k_5 \cdot x_9 \cdot x_{220} - k_{-5b} \cdot x_{223}$
(196) $\dot{x}_{224} = +k_{4b} \cdot x_{218} \cdot x_{12} - k_{-4} \cdot x_{224} + k_5 \cdot x_9 \cdot x_{221} - k_{-5b} \cdot x_{224}$
(197) $\dot{x}_{225} = -k_{4b} \cdot x_{225} \cdot x_{12} + k_{-4} \cdot x_{231} + k_{16} \cdot x_{22} \cdot x_{151} - k_{-24} \cdot x_{225} - k_{17} \cdot x_{24} \cdot x_{225} + k_{-17} \cdot x_{234} - k_{105} \cdot x_{225} \cdot x_{426} + k_{-105} \cdot x_{427}$
(198) $\dot{x}_{226} = -k_{4b} \cdot x_{226} \cdot x_{12} + k_{-4} \cdot x_{232} + k_{16} \cdot x_{22} \cdot x_{152} - k_{-24} \cdot x_{226} - k_{17} \cdot x_{24} \cdot x_{226} + k_{-17} \cdot x_{235} - k_{105} \cdot x_{226} \cdot x_{426} + k_{-105} \cdot x_{428}$
(199) $\dot{x}_{227} = -k_{4b} \cdot x_{227} \cdot x_{12} + k_{-4} \cdot x_{233} + k_{16} \cdot x_{22} \cdot x_{153} - k_{-24} \cdot x_{227} - k_{17} \cdot x_{24} \cdot x_{227} + k_{-17} \cdot x_{236} - k_{105} \cdot x_{227} \cdot x_{426} + k_{-105} \cdot x_{429}$
(200) $\dot{x}_{228} = -k_5 \cdot x_9 \cdot x_{228} + k_{-5b} \cdot x_{231} + k_{16} \cdot x_{165} \cdot x_{22} - k_{-24} \cdot x_{228} - k_{17} \cdot x_{24} \cdot x_{228} + k_{-17} \cdot x_{237}$
(201) $\dot{x}_{229} = -k_5 \cdot x_9 \cdot x_{229} + k_{-5b} \cdot x_{232} + k_{16} \cdot x_{166} \cdot x_{22} - k_{-24} \cdot x_{229} - k_{17} \cdot x_{24} \cdot x_{229} + k_{-17} \cdot x_{238}$
(202) $\dot{x}_{230} = -k_5 \cdot x_9 \cdot x_{230} + k_{-5b} \cdot x_{233} + k_{16} \cdot x_{167} \cdot x_{22} - k_{-24} \cdot x_{230} - k_{17} \cdot x_{24} \cdot x_{230} + k_{-17} \cdot x_{239}$
(203) $\dot{x}_{231} = +k_{4b} \cdot x_{225} \cdot x_{12} - k_{-4} \cdot x_{231} + k_5 \cdot x_9 \cdot x_{228} - k_{-5b} \cdot x_{231}$
(204) $\dot{x}_{232} = +k_{4b} \cdot x_{226} \cdot x_{12} - k_{-4} \cdot x_{232} + k_5 \cdot x_9 \cdot x_{229} - k_{-5b} \cdot x_{232}$
(205) $\dot{x}_{233} = +k_{4b} \cdot x_{227} \cdot x_{12} - k_{-4} \cdot x_{233} + k_5 \cdot x_9 \cdot x_{230} - k_{-5b} \cdot x_{233}$
(206) $\dot{x}_{234} = -k_{4b} \cdot x_{234} \cdot x_{12} + k_{-4} \cdot x_{240} + k_{17} \cdot x_{24} \cdot x_{225} - k_{-17} \cdot x_{234} - k_{18} \cdot x_{26} \cdot x_{234} + k_{-18} \cdot x_{243} - k_{19} \cdot x_{28} \cdot x_{234} + k_{-19} \cdot x_{243} - k_{20} \cdot x_{234} \cdot x_{43} + k_{-20} \cdot x_{252} - k_{21} \cdot x_{234} \cdot x_{26} + k_{-21} \cdot x_{252} + k_{34} \cdot x_{151} \cdot x_{30} - k_{-34} \cdot x_{234}$
(207) $\dot{x}_{235} = -k_{4b} \cdot x_{235} \cdot x_{12} + k_{-4} \cdot x_{241} + k_{17} \cdot x_{24} \cdot x_{226} - k_{-17} \cdot x_{235} - k_{18} \cdot x_{26} \cdot x_{235} + k_{-18} \cdot x_{244} - k_{19} \cdot x_{28} \cdot x_{235} + k_{-19} \cdot x_{244} - k_{20} \cdot x_{235} \cdot x_{43} + k_{-20} \cdot x_{253} - k_{21} \cdot x_{235} \cdot x_{26} + k_{-21} \cdot x_{253} + k_{34} \cdot x_{152} \cdot x_{30} - k_{-34} \cdot x_{235}$
(208) $\dot{x}_{236} = -k_{4b} \cdot x_{236} \cdot x_{12} + k_{-4} \cdot x_{242} + k_{17} \cdot x_{24} \cdot x_{227} - k_{-17} \cdot x_{236} - k_{18} \cdot x_{26} \cdot x_{236} + k_{-18} \cdot x_{245} - k_{19} \cdot x_{28} \cdot x_{236} + k_{-19} \cdot x_{245} - k_{20} \cdot x_{236} \cdot x_{43} + k_{-20} \cdot x_{254} - k_{21} \cdot x_{236} \cdot x_{26} + k_{-21} \cdot x_{254} + k_{34} \cdot x_{153} \cdot x_{30} - k_{-34} \cdot x_{236}$
(209) $\dot{x}_{237} = -k_5 \cdot x_9 \cdot x_{237} + k_{-5b} \cdot x_{240} + k_{17} \cdot x_{24} \cdot x_{228} - k_{-17} \cdot x_{237} - k_{18} \cdot x_{26} \cdot x_{237} + k_{-18} \cdot x_{246} - k_{19} \cdot x_{237} \cdot x_{69} + k_{-19} \cdot x_{246} - k_{20} \cdot x_{71} \cdot x_{237} + k_{-20} \cdot x_{255} - k_{21} \cdot x_{237} \cdot x_{26} + k_{-21} \cdot x_{255} + k_{34} \cdot x_{165} \cdot x_{30} - k_{-34} \cdot x_{237}$
(210) $\dot{x}_{238} = -k_5 \cdot x_9 \cdot x_{238} + k_{-5b} \cdot x_{241} + k_{17} \cdot x_{24} \cdot x_{229} - k_{-17} \cdot x_{238} - k_{18} \cdot x_{26} \cdot x_{238} + k_{-18} \cdot x_{247} - k_{19} \cdot x_{238} \cdot x_{69} + k_{-19} \cdot x_{247} - k_{20} \cdot x_{71} \cdot x_{238} + k_{-20} \cdot x_{256} - k_{21} \cdot x_{238} \cdot x_{26} + k_{-21} \cdot x_{256} + k_{34} \cdot x_{166} \cdot x_{30} - k_{-34} \cdot x_{238}$
(211) $\dot{x}_{239} = -k_5 \cdot x_9 \cdot x_{239} + k_{-5b} \cdot x_{242} + k_{17} \cdot x_{24} \cdot x_{230} - k_{-17} \cdot x_{239} - k_{18} \cdot x_{26} \cdot x_{239} + k_{-18} \cdot x_{248} - k_{19} \cdot x_{239} \cdot x_{69} + k_{-19} \cdot x_{248} - k_{20} \cdot x_{71} \cdot x_{239} + k_{-20} \cdot x_{257} - k_{21} \cdot x_{239} \cdot x_{26} + k_{-21} \cdot x_{257} + k_{34} \cdot x_{167} \cdot x_{30} - k_{-34} \cdot x_{239}$
(212) $\dot{x}_{240} = +k_{4b} \cdot x_{234} \cdot x_{12} - k_{-4} \cdot x_{240} + k_5 \cdot x_9 \cdot x_{237} - k_{-5b} \cdot x_{240}$
(213) $\dot{x}_{241} = +k_{4b} \cdot x_{235} \cdot x_{12} - k_{-4} \cdot x_{241} + k_5 \cdot x_9 \cdot x_{238} - k_{-5b} \cdot x_{241}$
(214) $\dot{x}_{242} = +k_{4b} \cdot x_{236} \cdot x_{12} - k_{-4} \cdot x_{242} + k_5 \cdot x_9 \cdot x_{239} - k_{-5b} \cdot x_{242}$
(215) $\dot{x}_{243} = -k_{4b} \cdot x_{243} \cdot x_{12} + k_{-4} \cdot x_{249} + k_{18} \cdot x_{26} \cdot x_{234} - k_{-18} \cdot x_{243} + k_{19} \cdot x_{28} \cdot x_{234} - k_{-19} \cdot x_{243}$
(216) $\dot{x}_{244} = -k_{4b} \cdot x_{244} \cdot x_{12} + k_{-4} \cdot x_{250} + k_{18} \cdot x_{26} \cdot x_{235} - k_{-18} \cdot x_{244} + k_{19} \cdot x_{28} \cdot x_{235} - k_{-19} \cdot x_{244}$
(217) $\dot{x}_{245} = -k_{4b} \cdot x_{245} \cdot x_{12} + k_{-4} \cdot x_{251} + k_{18} \cdot x_{26} \cdot x_{236} - k_{-18} \cdot x_{245} + k_{19} \cdot x_{28} \cdot x_{236} - k_{-19} \cdot x_{245}$
(218) $\dot{x}_{246} = -k_5 \cdot x_9 \cdot x_{246} + k_{-5b} \cdot x_{249} + k_{18} \cdot x_{26} \cdot x_{237} - k_{-18} \cdot x_{246} + k_{19} \cdot x_{237} \cdot x_{69} - k_{-19} \cdot x_{246}$
(219) $\dot{x}_{247} = -k_5 \cdot x_9 \cdot x_{247} + k_{-5b} \cdot x_{250} + k_{18} \cdot x_{26} \cdot x_{238} - k_{-18} \cdot x_{247} + k_{19} \cdot x_{238} \cdot x_{69} - k_{-19} \cdot x_{247}$

(220) $\dot{x}_{248} = -k_5 \cdot x_9 \cdot x_{248} + k_{-5b} \cdot x_{251} + k_{18} \cdot x_{26} \cdot x_{239} - k_{-18} \cdot x_{248} + k_{19} \cdot x_{239} \cdot x_{69} - k_{-19} \cdot x_{248}$
(221) $\dot{x}_{249} = +k_{4b} \cdot x_{243} \cdot x_{12} - k_{-4} \cdot x_{249} + k_5 \cdot x_9 \cdot x_{246} - k_{-5b} \cdot x_{249}$
(222) $\dot{x}_{250} = +k_{4b} \cdot x_{244} \cdot x_{12} - k_{-4} \cdot x_{250} + k_5 \cdot x_9 \cdot x_{247} - k_{-5b} \cdot x_{250}$
(223) $\dot{x}_{251} = +k_{4b} \cdot x_{245} \cdot x_{12} - k_{-4} \cdot x_{251} + k_5 \cdot x_9 \cdot x_{248} - k_{-5b} \cdot x_{251}$
(224) $\dot{x}_{252} = -k_4 \cdot x_{252} \cdot x_{12} + k_{-4} \cdot x_{258} + k_{20} \cdot x_{234} \cdot x_{43} - k_{-20} \cdot x_{252} + k_{21} \cdot x_{234} \cdot x_{26} - k_{-21} \cdot x_{252}$
(225) $\dot{x}_{253} = -k_4 \cdot x_{253} \cdot x_{12} + k_{-4} \cdot x_{259} + k_{20} \cdot x_{235} \cdot x_{43} - k_{-20} \cdot x_{253} + k_{21} \cdot x_{235} \cdot x_{26} - k_{-21} \cdot x_{253}$
(226) $\dot{x}_{254} = -k_4 \cdot x_{254} \cdot x_{12} + k_{-4} \cdot x_{260} + k_{20} \cdot x_{236} \cdot x_{43} - k_{-20} \cdot x_{254} + k_{21} \cdot x_{236} \cdot x_{26} - k_{-21} \cdot x_{254}$
(227) $\dot{x}_{255} = -k_5 \cdot x_9 \cdot x_{255} + k_{-5b} \cdot x_{258} + k_{20} \cdot x_{71} \cdot x_{237} - k_{-20} \cdot x_{255} + k_{21} \cdot x_{237} \cdot x_{26} - k_{-21} \cdot x_{255}$
(228) $\dot{x}_{256} = -k_5 \cdot x_9 \cdot x_{256} + k_{-5b} \cdot x_{259} + k_{20} \cdot x_{71} \cdot x_{238} - k_{-20} \cdot x_{256} + k_{21} \cdot x_{238} \cdot x_{26} - k_{-21} \cdot x_{256}$
(229) $\dot{x}_{257} = -k_5 \cdot x_9 \cdot x_{257} + k_{-5b} \cdot x_{260} + k_{20} \cdot x_{71} \cdot x_{239} - k_{-20} \cdot x_{257} + k_{21} \cdot x_{239} \cdot x_{26} - k_{-21} \cdot x_{257}$
(230) $\dot{x}_{258} = +k_4 \cdot x_{252} \cdot x_{12} - k_{-4} \cdot x_{258} + k_5 \cdot x_9 \cdot x_{255} - k_{-5b} \cdot x_{258}$
(231) $\dot{x}_{259} = +k_4 \cdot x_{253} \cdot x_{12} - k_{-4} \cdot x_{259} + k_5 \cdot x_9 \cdot x_{256} - k_{-5b} \cdot x_{259}$
(232) $\dot{x}_{260} = +k_4 \cdot x_{254} \cdot x_{12} - k_{-4} \cdot x_{260} + k_5 \cdot x_9 \cdot x_{257} - k_{-5b} \cdot x_{260}$
(233) $\dot{x}_{261} = +k_{66} \cdot x_{287} \cdot x_{445} - k_{-66} \cdot x_{261} - k_{68} \cdot x_{106} \cdot x_{261} + k_{-68} \cdot x_{449} - k_{106b} \cdot x_{444} \cdot x_{261} + k_{-106b} \cdot x_{449} - k_{112} \cdot x_{26} \cdot x_{261} + k_{-112} \cdot x_{265} - k_{113} \cdot x_{28} \cdot x_{261} + k_{-113} \cdot x_{265}$
(234) $\dot{x}_{262} = +k_{67} \cdot x_{287} \cdot x_{446} - k_{-67} \cdot x_{262} - k_{68} \cdot x_{106} \cdot x_{262} + k_{-68} \cdot x_{450} - k_{106b} \cdot x_{444} \cdot x_{262} + k_{-106b} \cdot x_{450} - k_{112} \cdot x_{26} \cdot x_{262} + k_{-112} \cdot x_{266} - k_{113} \cdot x_{28} \cdot x_{262} + k_{-113} \cdot x_{266}$
(235) $\dot{x}_{263} = +k_{66} \cdot x_{287} \cdot x_{447} - k_{-66} \cdot x_{263} - k_{68} \cdot x_{106} \cdot x_{263} + k_{-68} \cdot x_{451} - k_{106b} \cdot x_{444} \cdot x_{263} + k_{-106b} \cdot x_{451} - k_{112} \cdot x_{26} \cdot x_{263} + k_{-112} \cdot x_{267} - k_{113} \cdot x_{28} \cdot x_{263} + k_{-113} \cdot x_{267}$
(236) $\dot{x}_{264} = +k_{112} \cdot x_{26} \cdot x_{104} - k_{-112} \cdot x_{264} + k_{113} \cdot x_{28} \cdot x_{104} - k_{-113} \cdot x_{264}$
(237) $\dot{x}_{265} = +k_{112} \cdot x_{26} \cdot x_{261} - k_{-112} \cdot x_{265} + k_{113} \cdot x_{28} \cdot x_{261} - k_{-113} \cdot x_{265}$
(238) $\dot{x}_{266} = +k_{112} \cdot x_{26} \cdot x_{262} - k_{-112} \cdot x_{266} + k_{113} \cdot x_{28} \cdot x_{262} - k_{-113} \cdot x_{266}$
(239) $\dot{x}_{267} = +k_{112} \cdot x_{26} \cdot x_{263} - k_{-112} \cdot x_{267} + k_{113} \cdot x_{28} \cdot x_{263} - k_{-113} \cdot x_{267}$
(240) $\dot{x}_{268} = +k_{112} \cdot x_{26} \cdot x_{324} - k_{-112} \cdot x_{268} + k_{113} \cdot x_{28} \cdot x_{324} - k_{-113} \cdot x_{268}$
(241) $\dot{x}_{269} = +k_{112} \cdot x_{26} \cdot x_{405} - k_{-112} \cdot x_{269} + k_{113} \cdot x_{28} \cdot x_{405} - k_{-113} \cdot x_{269}$
(242) $\dot{x}_{279} = -k_{104} \cdot x_{279} \cdot x_{444} + k_{-104} \cdot x_{482} - k_{109} \cdot x_{106} \cdot x_{279} + k_{-109} \cdot x_{482}$
(243) $\dot{x}_{280} = -k_{94b} \cdot x_{280} \cdot x_{163} + k_{-94} \cdot x_{281} - k_{94b} \cdot x_{280} \cdot x_{164} + k_{-94} \cdot x_{282} - k_{94} \cdot x_{280} \cdot x_8 + k_{-94} \cdot x_{415} - k_{94} \cdot x_{280} \cdot x_{290} + k_{-94} \cdot x_{283} - k_{94} \cdot x_{280} \cdot x_{337} + k_{-94} \cdot x_{417} - k_{94} \cdot x_{280} \cdot x_{338} + k_{-94} \cdot x_{418} - k_{94} \cdot x_{280} \cdot x_{162} + k_{-94} \cdot x_{416} - k_{95} \cdot x_{280} \cdot x_{159} + k_{-95} \cdot x_{416} - k_{95} \cdot x_{280} \cdot x_{160} + k_{-95} \cdot x_{281} - k_{95} \cdot x_{280} \cdot x_{161} + k_{-95} \cdot x_{282} - k_{95} \cdot x_{280} \cdot x_{11} + k_{-95} \cdot x_{415} - k_{95} \cdot x_{280} \cdot x_{425} + k_{-95} \cdot x_{283} - k_{95} \cdot x_{280} \cdot x_{339} + k_{-95} \cdot x_{417} - k_{95} \cdot x_{280} \cdot x_{340} + k_{-95} \cdot x_{418}$
(244) $\dot{x}_{281} = +k_{94b} \cdot x_{280} \cdot x_{163} - k_{-94} \cdot x_{281} + k_{95} \cdot x_{280} \cdot x_{160} - k_{-95} \cdot x_{281}$
(245) $\dot{x}_{282} = +k_{94b} \cdot x_{280} \cdot x_{164} - k_{-94} \cdot x_{282} + k_{95} \cdot x_{280} \cdot x_{161} - k_{-95} \cdot x_{282}$
(246) $\dot{x}_{283} = +k_{94} \cdot x_{280} \cdot x_{290} - k_{-94} \cdot x_{283} + k_{95} \cdot x_{280} \cdot x_{425} - k_{-95} \cdot x_{283}$
(247) $\dot{x}_{284} = +k_{103} \cdot x_{87} \cdot x_{141} - k_{-103} \cdot x_{284}$
(248) $\dot{x}_{285} = -k_{97} \cdot x_{531} \cdot x_{285} + k_{-97} \cdot x_{286} - k_{98} \cdot x_{141} \cdot x_{285} + k_{-98} \cdot x_{502} - k_{99} \cdot x_{143} \cdot x_{285} + k_{-99} \cdot x_{503} - k_{100} \cdot x_{140} \cdot x_{285} + k_{-100} \cdot x_{506} - k_{97c} \cdot x_{532} \cdot x_{285} + k_{-97c} \cdot x_{525}$
(249) $\dot{x}_{286} = -k_1 \cdot x_1 \cdot x_{286} + k_{-1} \cdot x_{499} + k_{97} \cdot x_{531} \cdot x_{285} - k_{-97} \cdot x_{286}$
(250) $\dot{x}_{287} = -k_{66} \cdot x_{287} \cdot x_{486} + k_{-66} \cdot x_{104} - k_{66} \cdot x_{287} \cdot x_{447} + k_{-66} \cdot x_{263} - k_{66} \cdot x_{287} \cdot x_{445} + k_{-66} \cdot x_{261} - k_{67} \cdot x_{287} \cdot x_{446} + k_{-67} \cdot x_{262} - k_{67} \cdot x_{287} \cdot x_{454} + k_{-67} \cdot x_{324} - k_{67} \cdot x_{287} \cdot x_{457} + k_{-67} \cdot x_{405} - k_{66} \cdot x_{287} \cdot x_{460} + k_{-66} \cdot x_{408}$
(251) $\dot{x}_{288} = -k_{1c} \cdot x_{288} \cdot x_1 + k_{-1c} \cdot x_{335} + k_{103} \cdot x_{141} \cdot x_{140} - k_{-103} \cdot x_{288}$
(252) $\dot{x}_{289} = -k_8 \cdot x_{289} \cdot x_{14} + k_{-8} \cdot x_{291} + k_{96} \cdot x_{87} \cdot x_{87} - k_{-96} \cdot x_{289}$
(253) $\dot{x}_{290} = -k_8 \cdot x_{290} \cdot x_{14} + k_{-8} \cdot x_{293} - k_{94} \cdot x_{280} \cdot x_{290} + k_{-94} \cdot x_{283}$
(254) $\dot{x}_{291} = +k_8 \cdot x_{289} \cdot x_{14} - k_{-8} \cdot x_{291} - k_{16} \cdot x_{291} \cdot x_{22} + k_{-63} \cdot x_{312} - k_{22} \cdot x_{31} \cdot x_{291} + k_{-22b} \cdot x_{294} - k_{32} \cdot x_{291} \cdot x_{38} + k_{-32} \cdot x_{303} - k_{34} \cdot x_{291} \cdot x_{30} + k_{-34} \cdot x_{315} - k_{37} \cdot x_{291} \cdot x_{40} + k_{-37} \cdot x_{297} - k_{37} \cdot x_{291} \cdot x_{39} + k_{-37} \cdot x_{300}$
(255) $\dot{x}_{293} = +k_8 \cdot x_{290} \cdot x_{14} - k_{-8} \cdot x_{293} - k_{16} \cdot x_{293} \cdot x_{22} + k_{-63} \cdot x_{314} - k_{22} \cdot x_{31} \cdot x_{293} + k_{-22b} \cdot x_{296} - k_{32} \cdot x_{293} \cdot x_{38} + k_{-32} \cdot x_{305} - k_{34} \cdot x_{293} \cdot x_{30} + k_{-34} \cdot x_{317} - k_{37} \cdot x_{293} \cdot x_{40} + k_{-37} \cdot x_{299} - k_{37} \cdot x_{293} \cdot x_{39} + k_{-37} \cdot x_{302}$

(256) $\dot{x}_{294} = +k_{22} \cdot x_{31} \cdot x_{291} - k_{-22b} \cdot x_{294}$
(257) $\dot{x}_{296} = +k_{22} \cdot x_{31} \cdot x_{293} - k_{-22b} \cdot x_{296}$
(258) $\dot{x}_{297} = -k_{16} \cdot x_{22} \cdot x_{297} + k_{-24} \cdot x_{300} + k_{37} \cdot x_{291} \cdot x_{40} - k_{-37} \cdot x_{297} - k_{41} \cdot x_{30} \cdot x_{297} + k_{-41} \cdot x_{303}$
(259) $\dot{x}_{299} = -k_{16} \cdot x_{22} \cdot x_{299} + k_{-24} \cdot x_{302} + k_{37} \cdot x_{293} \cdot x_{40} - k_{-37} \cdot x_{299} - k_{41} \cdot x_{30} \cdot x_{299} + k_{-41} \cdot x_{305}$
(260) $\dot{x}_{300} = -k_{4b} \cdot x_{300} \cdot x_{12} + k_{-4} \cdot x_{301} + k_{16} \cdot x_{22} \cdot x_{297} - k_{-24} \cdot x_{300} - k_{25} \cdot x_{24} \cdot x_{300} + k_{-25} \cdot x_{303} + k_{37} \cdot x_{291} \cdot x_{39} - k_{-37} \cdot x_{300}$
(261) $\dot{x}_{301} = +k_{4b} \cdot x_{300} \cdot x_{12} - k_{-4} \cdot x_{301} + k_{5} \cdot x_{9} \cdot x_{302} - k_{-5b} \cdot x_{301}$
(262) $\dot{x}_{302} = -k_{5} \cdot x_{9} \cdot x_{302} + k_{-5b} \cdot x_{301} + k_{16} \cdot x_{22} \cdot x_{299} - k_{-24} \cdot x_{302} - k_{25} \cdot x_{24} \cdot x_{302} + k_{-25} \cdot x_{305} + k_{37} \cdot x_{293} \cdot x_{39} - k_{-37} \cdot x_{302}$
(263) $\dot{x}_{303} = -k_{4b} \cdot x_{303} \cdot x_{12} + k_{-4} \cdot x_{304} - k_{18} \cdot x_{26} \cdot x_{303} + k_{-18} \cdot x_{306} - k_{19} \cdot x_{28} \cdot x_{303} + k_{-19} \cdot x_{306} - k_{20} \cdot x_{43} \cdot x_{303} + k_{-20} \cdot x_{309} - k_{21} \cdot x_{303} \cdot x_{26} + k_{-21} \cdot x_{309} + k_{25} \cdot x_{24} \cdot x_{300} - k_{-25} \cdot x_{303} + k_{32} \cdot x_{291} \cdot x_{38} - k_{-32} \cdot x_{303} + k_{41} \cdot x_{30} \cdot x_{297} - k_{-41} \cdot x_{303}$
(264) $\dot{x}_{304} = +k_{4b} \cdot x_{303} \cdot x_{12} - k_{-4} \cdot x_{304} + k_{5} \cdot x_{9} \cdot x_{305} - k_{-5b} \cdot x_{304}$
(265) $\dot{x}_{305} = -k_{5} \cdot x_{9} \cdot x_{305} + k_{-5b} \cdot x_{304} - k_{18} \cdot x_{26} \cdot x_{305} + k_{-18} \cdot x_{308} - k_{19} \cdot x_{69} \cdot x_{305} + k_{-19} \cdot x_{308} - k_{20} \cdot x_{71} \cdot x_{305} + k_{-20} \cdot x_{311} - k_{21} \cdot x_{305} \cdot x_{26} + k_{-21} \cdot x_{311} + k_{25} \cdot x_{24} \cdot x_{302} - k_{-25} \cdot x_{305} + k_{32} \cdot x_{293} \cdot x_{38} - k_{-32} \cdot x_{305} + k_{41} \cdot x_{30} \cdot x_{299} - k_{-41} \cdot x_{305}$
(266) $\dot{x}_{306} = -k_{4b} \cdot x_{306} \cdot x_{12} + k_{-4} \cdot x_{307} + k_{18} \cdot x_{26} \cdot x_{303} - k_{-18} \cdot x_{306} + k_{19} \cdot x_{28} \cdot x_{303} - k_{-19} \cdot x_{306}$
(267) $\dot{x}_{307} = +k_{4b} \cdot x_{306} \cdot x_{12} - k_{-4} \cdot x_{307} + k_{5} \cdot x_{9} \cdot x_{308} - k_{-5b} \cdot x_{307}$
(268) $\dot{x}_{308} = -k_{5} \cdot x_{9} \cdot x_{308} + k_{-5b} \cdot x_{307} + k_{18} \cdot x_{26} \cdot x_{305} - k_{-18} \cdot x_{308} + k_{19} \cdot x_{69} \cdot x_{305} - k_{-19} \cdot x_{308}$
(269) $\dot{x}_{309} = -k_{4b} \cdot x_{309} \cdot x_{12} + k_{-4} \cdot x_{310} + k_{20} \cdot x_{43} \cdot x_{303} - k_{-20} \cdot x_{309} + k_{21} \cdot x_{303} \cdot x_{26} - k_{-21} \cdot x_{309}$
(270) $\dot{x}_{310} = +k_{4b} \cdot x_{309} \cdot x_{12} - k_{-4} \cdot x_{310} + k_{5} \cdot x_{9} \cdot x_{311} - k_{-5b} \cdot x_{310}$
(271) $\dot{x}_{311} = -k_{5} \cdot x_{9} \cdot x_{311} + k_{-5b} \cdot x_{310} + k_{20} \cdot x_{71} \cdot x_{305} - k_{-20} \cdot x_{311} + k_{21} \cdot x_{305} \cdot x_{26} - k_{-21} \cdot x_{311}$
(272) $\dot{x}_{312} = -k_{4b} \cdot x_{312} \cdot x_{12} + k_{-4} \cdot x_{313} + k_{16} \cdot x_{291} \cdot x_{22} - k_{-63} \cdot x_{312} - k_{17} \cdot x_{24} \cdot x_{312} + k_{-17} \cdot x_{315} - k_{105} \cdot x_{312} \cdot x_{426} + k_{-105} \cdot x_{436}$
(273) $\dot{x}_{313} = +k_{4b} \cdot x_{312} \cdot x_{12} - k_{-4} \cdot x_{313} + k_{5} \cdot x_{9} \cdot x_{314} - k_{-5b} \cdot x_{313}$
(274) $\dot{x}_{314} = -k_{5} \cdot x_{9} \cdot x_{314} + k_{-5b} \cdot x_{313} + k_{16} \cdot x_{293} \cdot x_{22} - k_{-63} \cdot x_{314} - k_{17} \cdot x_{24} \cdot x_{314} + k_{-17} \cdot x_{317}$
(275) $\dot{x}_{315} = -k_{4b} \cdot x_{315} \cdot x_{12} + k_{-4} \cdot x_{316} + k_{17} \cdot x_{24} \cdot x_{312} - k_{-17} \cdot x_{315} - k_{18} \cdot x_{26} \cdot x_{315} + k_{-18} \cdot x_{318} - k_{19} \cdot x_{28} \cdot x_{315} + k_{-19} \cdot x_{318} - k_{20} \cdot x_{315} \cdot x_{43} + k_{-20} \cdot x_{321} - k_{21} \cdot x_{315} \cdot x_{26} + k_{-21} \cdot x_{321} + k_{34} \cdot x_{291} \cdot x_{30} - k_{-34} \cdot x_{315}$
(276) $\dot{x}_{316} = +k_{4b} \cdot x_{315} \cdot x_{12} - k_{-4} \cdot x_{316} + k_{5} \cdot x_{9} \cdot x_{317} - k_{-5b} \cdot x_{316}$
(277) $\dot{x}_{317} = -k_{5} \cdot x_{9} \cdot x_{317} + k_{-5b} \cdot x_{316} + k_{17} \cdot x_{24} \cdot x_{314} - k_{-17} \cdot x_{317} - k_{18} \cdot x_{26} \cdot x_{317} + k_{-18} \cdot x_{320} - k_{19} \cdot x_{69} \cdot x_{317} + k_{-19} \cdot x_{320} - k_{20} \cdot x_{317} \cdot x_{71} + k_{-20} \cdot x_{323} - k_{21} \cdot x_{317} \cdot x_{26} + k_{-21} \cdot x_{323} + k_{34} \cdot x_{293} \cdot x_{30} - k_{-34} \cdot x_{317}$
(278) $\dot{x}_{318} = -k_{4b} \cdot x_{318} \cdot x_{12} + k_{-4} \cdot x_{319} + k_{18} \cdot x_{26} \cdot x_{315} - k_{-18} \cdot x_{318} + k_{19} \cdot x_{28} \cdot x_{315} - k_{-19} \cdot x_{318}$
(279) $\dot{x}_{319} = +k_{4b} \cdot x_{318} \cdot x_{12} - k_{-4} \cdot x_{319} + k_{5} \cdot x_{9} \cdot x_{320} - k_{-5b} \cdot x_{319}$
(280) $\dot{x}_{320} = -k_{5} \cdot x_{9} \cdot x_{320} + k_{-5b} \cdot x_{319} + k_{18} \cdot x_{26} \cdot x_{317} - k_{-18} \cdot x_{320} + k_{19} \cdot x_{69} \cdot x_{317} - k_{-19} \cdot x_{320}$
(281) $\dot{x}_{321} = -k_{4b} \cdot x_{321} \cdot x_{12} + k_{-4} \cdot x_{322} + k_{20} \cdot x_{315} \cdot x_{43} - k_{-20} \cdot x_{321} + k_{21} \cdot x_{315} \cdot x_{26} - k_{-21} \cdot x_{321}$
(282) $\dot{x}_{322} = +k_{4b} \cdot x_{321} \cdot x_{12} - k_{-4} \cdot x_{322} + k_{5} \cdot x_{9} \cdot x_{323} - k_{-5b} \cdot x_{322}$
(283) $\dot{x}_{323} = -k_{5} \cdot x_{9} \cdot x_{323} + k_{-5b} \cdot x_{322} + k_{20} \cdot x_{317} \cdot x_{71} - k_{-20} \cdot x_{323} + k_{21} \cdot x_{317} \cdot x_{26} - k_{-21} \cdot x_{323}$
(284) $\dot{x}_{324} = +k_{67} \cdot x_{287} \cdot x_{454} - k_{-67} \cdot x_{324} - k_{68} \cdot x_{106} \cdot x_{324} + k_{-68} \cdot x_{452} - k_{106} \cdot x_{444} \cdot x_{324} + k_{-106} \cdot x_{452} - k_{112} \cdot x_{26} \cdot x_{324} + k_{-112} \cdot x_{268} - k_{113} \cdot x_{28} \cdot x_{324} + k_{-113} \cdot x_{268}$
(285) $\dot{x}_{325} = +k_{112} \cdot x_{26} \cdot x_{408} - k_{-112} \cdot x_{325} + k_{113} \cdot x_{28} \cdot x_{479} - k_{-113} \cdot x_{325}$
(286) $\dot{x}_{330} = -k_{102} \cdot x_{330} \cdot x_{330} + k_{-102} \cdot x_{5} - k_{102} \cdot x_{330} \cdot x_{330} + k_{-102} \cdot x_{5} - k_{102} \cdot x_{87} \cdot x_{330} + k_{-102} \cdot x_{148} - k_{102} \cdot x_{330} \cdot x_{331} + k_{-102} \cdot x_{149} - k_{102} \cdot x_{330} \cdot x_{332} + k_{-102} \cdot x_{150}$
(287) $\dot{x}_{331} = -k_{102} \cdot x_{330} \cdot x_{331} + k_{-102} \cdot x_{149} - k_{103} \cdot x_{87} \cdot x_{331} + k_{-103} \cdot x_{335}$
(288) $\dot{x}_{332} = -k_{102} \cdot x_{330} \cdot x_{332} + k_{-102} \cdot x_{150} - k_{103} \cdot x_{87} \cdot x_{332} + k_{-103} \cdot x_{336}$
(289) $\dot{x}_{335} = +k_{1c} \cdot x_{288} \cdot x_{1} - k_{-1c} \cdot x_{335} - k_{8} \cdot x_{14} \cdot x_{335} + k_{-8} \cdot x_{341} + k_{103} \cdot x_{87} \cdot x_{331} - k_{-103} \cdot x_{335}$
(290) $\dot{x}_{336} = +k_{1-} \cdot x_{117} \cdot x_{1} - k_{-1-} \cdot x_{336} - k_{8} \cdot x_{14} \cdot x_{336} + k_{-8} \cdot x_{344} + k_{103} \cdot x_{87} \cdot x_{332} - k_{-103} \cdot x_{336}$

(291) $\dot{x}_{337} = -k_{8} \cdot x_{14} \cdot x_{337} + k_{-8} \cdot x_{343} - k_{94} \cdot x_{280} \cdot x_{337} + k_{-94} \cdot x_{417}$

(292) $\dot{x}_{338} = -k_{8} \cdot x_{14} \cdot x_{338} + k_{-8} \cdot x_{346} - k_{94} \cdot x_{280} \cdot x_{338} + k_{-94} \cdot x_{418}$

(293) $\dot{x}_{339} = -k_{95} \cdot x_{280} \cdot x_{339} + k_{-95} \cdot x_{417}$

(294) $\dot{x}_{340} = -k_{95} \cdot x_{280} \cdot x_{340} + k_{-95} \cdot x_{418}$

(295) $\dot{x}_{341} = +k_{8} \cdot x_{14} \cdot x_{335} - k_{-8} \cdot x_{341} - k_{16} \cdot x_{341} \cdot x_{22} + k_{-63} \cdot x_{381} - k_{22} \cdot x_{31} \cdot x_{341} + k_{-22b} \cdot x_{347} - k_{32} \cdot x_{341} \cdot x_{38} + k_{-32} \cdot x_{363} - k_{34} \cdot x_{341} \cdot x_{30} + k_{-34} \cdot x_{387} - k_{37} \cdot x_{341} \cdot x_{40} + k_{-37} \cdot x_{351} - k_{37} \cdot x_{341} \cdot x_{39} + k_{-37} \cdot x_{357}$

(296) $\dot{x}_{343} = +k_{8} \cdot x_{14} \cdot x_{337} - k_{-8} \cdot x_{343} - k_{16} \cdot x_{343} \cdot x_{22} + k_{-24} \cdot x_{383} - k_{22} \cdot x_{31} \cdot x_{343} + k_{-22b} \cdot x_{349} - k_{32} \cdot x_{343} \cdot x_{38} + k_{-32} \cdot x_{365} - k_{34} \cdot x_{343} \cdot x_{30} + k_{-34} \cdot x_{389} - k_{37} \cdot x_{343} \cdot x_{40} + k_{-37} \cdot x_{353} - k_{37} \cdot x_{343} \cdot x_{39} + k_{-37} \cdot x_{359}$

(297) $\dot{x}_{344} = +k_{8} \cdot x_{14} \cdot x_{336} - k_{-8} \cdot x_{344} - k_{16} \cdot x_{344} \cdot x_{22} + k_{-24} \cdot x_{384} - k_{22} \cdot x_{31} \cdot x_{344} + k_{-22} \cdot x_{348} - k_{32} \cdot x_{344} \cdot x_{38} + k_{-32} \cdot x_{366} - k_{34} \cdot x_{344} \cdot x_{30} + k_{-34} \cdot x_{390} - k_{37} \cdot x_{344} \cdot x_{40} + k_{-37} \cdot x_{354} - k_{37} \cdot x_{344} \cdot x_{39} + k_{-37} \cdot x_{360}$

(298) $\dot{x}_{345} = +k_{120} \cdot x_{141} \cdot x_{144} - k_{-120} \cdot x_{345}$

(299) $\dot{x}_{346} = +k_{8} \cdot x_{14} \cdot x_{338} - k_{-8} \cdot x_{346} - k_{16} \cdot x_{346} \cdot x_{22} + k_{-63} \cdot x_{386} - k_{22} \cdot x_{31} \cdot x_{346} + k_{-22} \cdot x_{350} + k_{23} \cdot x_{31} - k_{-23} \cdot x_{346} + k_{23} \cdot x_{31} - k_{-23} \cdot x_{346} + k_{23} \cdot x_{31} - k_{-23} \cdot x_{346} + k_{23} \cdot x_{31} - k_{-23} \cdot x_{346} + k_{23} \cdot x_{31} - k_{-23} \cdot x_{346} + k_{23} \cdot x_{31} - k_{-23} \cdot x_{346} + k_{23} \cdot x_{31} - k_{-23} \cdot x_{346} + k_{23} \cdot x_{31} - k_{-23} \cdot x_{346} + k_{23} \cdot x_{31} - k_{-23} \cdot x_{346} + k_{23} \cdot x_{31} - k_{-23} \cdot x_{346} + k_{23} \cdot x_{31} - k_{-23} \cdot x_{346} + k_{23} \cdot x_{31} - k_{-23} \cdot x_{346} + k_{23} \cdot x_{31} - k_{-23} \cdot x_{346} + k_{23} \cdot x_{31} - k_{-23} \cdot x_{346} - k_{32} \cdot x_{346} \cdot x_{38} + k_{-32} \cdot x_{368} - k_{34} \cdot x_{346} \cdot x_{30} + k_{-34} \cdot x_{392} - k_{37} \cdot x_{346} \cdot x_{40} + k_{-37} \cdot x_{356} - k_{37} \cdot x_{346} \cdot x_{39} + k_{-37} \cdot x_{362}$

(300) $\dot{x}_{347} = +k_{22} \cdot x_{31} \cdot x_{341} - k_{-22b} \cdot x_{347}$

(301) $\dot{x}_{348} = +k_{22} \cdot x_{31} \cdot x_{344} - k_{-22} \cdot x_{348}$

(302) $\dot{x}_{349} = +k_{22} \cdot x_{31} \cdot x_{343} - k_{-22b} \cdot x_{349}$

(303) $\dot{x}_{350} = +k_{22} \cdot x_{31} \cdot x_{346} - k_{-22} \cdot x_{350}$

(304) $\dot{x}_{351} = -k_{16} \cdot x_{22} \cdot x_{351} + k_{-24} \cdot x_{357} + k_{37} \cdot x_{341} \cdot x_{40} - k_{-37} \cdot x_{351} - k_{41} \cdot x_{30} \cdot x_{351} + k_{-41} \cdot x_{363}$

(305) $\dot{x}_{353} = -k_{16} \cdot x_{22} \cdot x_{353} + k_{-24} \cdot x_{359} + k_{37} \cdot x_{343} \cdot x_{40} - k_{-37} \cdot x_{353} - k_{41} \cdot x_{30} \cdot x_{353} + k_{-41} \cdot x_{365}$

(306) $\dot{x}_{354} = -k_{16} \cdot x_{22} \cdot x_{354} + k_{-24} \cdot x_{360} + k_{37} \cdot x_{344} \cdot x_{40} - k_{-37} \cdot x_{354} - k_{41} \cdot x_{30} \cdot x_{354} + k_{-41} \cdot x_{366}$

(307) $\dot{x}_{355} = +k_{120} \cdot x_{142} \cdot x_{141} - k_{-120} \cdot x_{355}$

(308) $\dot{x}_{356} = -k_{16} \cdot x_{22} \cdot x_{356} + k_{-24} \cdot x_{362} + k_{37} \cdot x_{346} \cdot x_{40} - k_{-37} \cdot x_{356} - k_{41} \cdot x_{30} \cdot x_{356} + k_{-41} \cdot x_{368}$

(309) $\dot{x}_{357} = -k_{4b} \cdot x_{357} \cdot x_{12} + k_{-4} \cdot x_{358} + k_{16} \cdot x_{22} \cdot x_{351} - k_{-24} \cdot x_{357} - k_{25} \cdot x_{24} \cdot x_{357} + k_{-25} \cdot x_{363} + k_{37} \cdot x_{341} \cdot x_{39} - k_{-37} \cdot x_{357}$

(310) $\dot{x}_{358} = +k_{4b} \cdot x_{357} \cdot x_{12} - k_{-4} \cdot x_{358} + k_{5b} \cdot x_{9} \cdot x_{359} - k_{-5b} \cdot x_{358}$

(311) $\dot{x}_{359} = -k_{5b} \cdot x_{9} \cdot x_{359} + k_{-5b} \cdot x_{358} + k_{16} \cdot x_{22} \cdot x_{353} - k_{-24} \cdot x_{359} - k_{25} \cdot x_{24} \cdot x_{359} + k_{-25} \cdot x_{365} + k_{37} \cdot x_{343} \cdot x_{39} - k_{-37} \cdot x_{359}$

(312) $\dot{x}_{360} = -k_{4b} \cdot x_{360} \cdot x_{12} + k_{-4} \cdot x_{361} + k_{16} \cdot x_{22} \cdot x_{354} - k_{-24} \cdot x_{360} - k_{25} \cdot x_{24} \cdot x_{360} + k_{-25} \cdot x_{366} + k_{37} \cdot x_{344} \cdot x_{39} - k_{-37} \cdot x_{360}$

(313) $\dot{x}_{361} = +k_{4b} \cdot x_{360} \cdot x_{12} - k_{-4} \cdot x_{361} + k_{5b} \cdot x_{9} \cdot x_{362} - k_{-5b} \cdot x_{361}$

(314) $\dot{x}_{362} = -k_{5b} \cdot x_{9} \cdot x_{362} + k_{-5b} \cdot x_{361} + k_{16} \cdot x_{22} \cdot x_{356} - k_{-24} \cdot x_{362} - k_{25} \cdot x_{24} \cdot x_{362} + k_{-25} \cdot x_{368} + k_{37} \cdot x_{346} \cdot x_{39} - k_{-37} \cdot x_{362}$

(315) $\dot{x}_{363} = -k_{4b} \cdot x_{363} \cdot x_{12} + k_{-4} \cdot x_{364} - k_{18} \cdot x_{26} \cdot x_{363} + k_{-18} \cdot x_{369} - k_{19} \cdot x_{28} \cdot x_{363} + k_{-19} \cdot x_{369} - k_{20} \cdot x_{43} \cdot x_{363} + k_{-20} \cdot x_{375} - k_{21} \cdot x_{363} \cdot x_{26} + k_{-21} \cdot x_{375} + k_{25} \cdot x_{24} \cdot x_{357} - k_{-25} \cdot x_{363} + k_{32} \cdot x_{341} \cdot x_{38} - k_{-32} \cdot x_{363} + k_{41} \cdot x_{30} \cdot x_{351} - k_{-41} \cdot x_{363}$

(316) $\dot{x}_{364} = +k_{4b} \cdot x_{363} \cdot x_{12} - k_{-4} \cdot x_{364} + k_{5b} \cdot x_{9} \cdot x_{365} - k_{-5b} \cdot x_{364}$

(317) $\dot{x}_{365} = -k_{5b} \cdot x_{9} \cdot x_{365} + k_{-5b} \cdot x_{364} - k_{18} \cdot x_{26} \cdot x_{365} + k_{-18} \cdot x_{371} - k_{19} \cdot x_{69} \cdot x_{365} + k_{-19} \cdot x_{371} - k_{20} \cdot x_{71} \cdot x_{365} + k_{-20} \cdot x_{377} - k_{21} \cdot x_{365} \cdot x_{26} + k_{-21} \cdot x_{377} + k_{25} \cdot x_{24} \cdot x_{359} - k_{-25} \cdot x_{365} + k_{32} \cdot x_{343} \cdot x_{38} - k_{-32} \cdot x_{365} + k_{41} \cdot x_{30} \cdot x_{353} - k_{-41} \cdot x_{365}$

(318) $\dot{x}_{366} = -k_{4b} \cdot x_{366} \cdot x_{12} + k_{-4} \cdot x_{367} - k_{18} \cdot x_{26} \cdot x_{366} + k_{-18} \cdot x_{372} - k_{19} \cdot x_{28} \cdot x_{366} + k_{-19} \cdot x_{372} - k_{20} \cdot x_{43} \cdot x_{366} + k_{-20} \cdot x_{378} - k_{21} \cdot x_{366} \cdot x_{26} + k_{-21} \cdot x_{378} + k_{25} \cdot x_{24} \cdot x_{360} - k_{-25} \cdot x_{366} + k_{32} \cdot x_{344} \cdot x_{38} - k_{-32} \cdot x_{366} + k_{41} \cdot x_{30} \cdot x_{354} - k_{-41} \cdot x_{366}$

(319) $\dot{x}_{367} = +k_{4b} \cdot x_{366} \cdot x_{12} - k_{-4} \cdot x_{367} + k_{5b} \cdot x_{9} \cdot x_{368} - k_{-5b} \cdot x_{367}$

(320) $\dot{x}_{368} = -k_{5b} \cdot x_9 \cdot x_{368} + k_{-5b} \cdot x_{367} - k_{18} \cdot x_{26} \cdot x_{368} + k_{-18} \cdot x_{374} - k_{19} \cdot x_{69} \cdot x_{368} + k_{-19} \cdot x_{374} - k_{20} \cdot x_{71} \cdot x_{368} + k_{-20} \cdot x_{380} - k_{21} \cdot x_{368} \cdot x_{26} + k_{-21} \cdot x_{380} + k_{25} \cdot x_{24} \cdot x_{362} - k_{-25} \cdot x_{368} + k_{32} \cdot x_{346} \cdot x_{38} - k_{-32} \cdot x_{368} + k_{41} \cdot x_{30} \cdot x_{356} - k_{-41} \cdot x_{368}$
(321) $\dot{x}_{369} = -k_{4b} \cdot x_{369} \cdot x_{12} + k_{-4} \cdot x_{370} + k_{18} \cdot x_{26} \cdot x_{363} - k_{-18} \cdot x_{369} + k_{19} \cdot x_{28} \cdot x_{363} - k_{-19} \cdot x_{369}$
(322) $\dot{x}_{370} = +k_{4b} \cdot x_{369} \cdot x_{12} - k_{-4} \cdot x_{370} + k_{5b} \cdot x_9 \cdot x_{371} - k_{-5b} \cdot x_{370}$
(323) $\dot{x}_{371} = -k_{5b} \cdot x_9 \cdot x_{371} + k_{-5b} \cdot x_{370} + k_{18} \cdot x_{26} \cdot x_{365} - k_{-18} \cdot x_{371} + k_{19} \cdot x_{69} \cdot x_{365} - k_{-19} \cdot x_{371}$
(324) $\dot{x}_{372} = -k_{4b} \cdot x_{372} \cdot x_{12} + k_{-4} \cdot x_{373} + k_{18} \cdot x_{26} \cdot x_{366} - k_{-18} \cdot x_{372} + k_{19} \cdot x_{28} \cdot x_{366} - k_{-19} \cdot x_{372}$
(325) $\dot{x}_{373} = +k_{4b} \cdot x_{372} \cdot x_{12} - k_{-4} \cdot x_{373} + k_{5b} \cdot x_9 \cdot x_{374} - k_{-5b} \cdot x_{373}$
(326) $\dot{x}_{374} = -k_{5b} \cdot x_9 \cdot x_{374} + k_{-5b} \cdot x_{373} + k_{18} \cdot x_{26} \cdot x_{368} - k_{-18} \cdot x_{374} + k_{19} \cdot x_{69} \cdot x_{368} - k_{-19} \cdot x_{374}$
(327) $\dot{x}_{375} = -k_{4b} \cdot x_{375} \cdot x_{12} + k_{-4} \cdot x_{376} + k_{20} \cdot x_{43} \cdot x_{363} - k_{-20} \cdot x_{375} + k_{21} \cdot x_{363} \cdot x_{26} - k_{-21} \cdot x_{375}$
(328) $\dot{x}_{376} = +k_{4b} \cdot x_{375} \cdot x_{12} - k_{-4} \cdot x_{376} + k_{5b} \cdot x_9 \cdot x_{377} - k_{-5b} \cdot x_{376}$
(329) $\dot{x}_{377} = -k_{5b} \cdot x_9 \cdot x_{377} + k_{-5b} \cdot x_{376} + k_{20} \cdot x_{71} \cdot x_{365} - k_{-20} \cdot x_{377} + k_{21} \cdot x_{365} \cdot x_{26} - k_{-21} \cdot x_{377}$
(330) $\dot{x}_{378} = -k_{4b} \cdot x_{378} \cdot x_{12} + k_{-4} \cdot x_{379} + k_{20} \cdot x_{43} \cdot x_{366} - k_{-20} \cdot x_{378} + k_{21} \cdot x_{366} \cdot x_{26} - k_{-21} \cdot x_{378}$
(331) $\dot{x}_{379} = +k_{4b} \cdot x_{378} \cdot x_{12} - k_{-4} \cdot x_{379} + k_{5b} \cdot x_9 \cdot x_{380} - k_{-5b} \cdot x_{379}$
(332) $\dot{x}_{380} = -k_{5b} \cdot x_9 \cdot x_{380} + k_{-5b} \cdot x_{379} + k_{20} \cdot x_{71} \cdot x_{368} - k_{-20} \cdot x_{380} + k_{21} \cdot x_{368} \cdot x_{26} - k_{-21} \cdot x_{380}$
(333) $\dot{x}_{381} = -k_{4b} \cdot x_{381} \cdot x_{12} + k_{-4} \cdot x_{382} + k_{16} \cdot x_{341} \cdot x_{22} - k_{-63} \cdot x_{381} - k_{17} \cdot x_{24} \cdot x_{381} + k_{-17} \cdot x_{387} - k_{105} \cdot x_{381} \cdot x_{426} + k_{-105} \cdot x_{439}$
(334) $\dot{x}_{382} = +k_{4b} \cdot x_{381} \cdot x_{12} - k_{-4} \cdot x_{382} + k_{5b} \cdot x_9 \cdot x_{383} - k_{-5b} \cdot x_{382}$
(335) $\dot{x}_{383} = -k_{5b} \cdot x_9 \cdot x_{383} + k_{-5b} \cdot x_{382} + k_{16} \cdot x_{343} \cdot x_{22} - k_{-24} \cdot x_{383} - k_{17} \cdot x_{24} \cdot x_{383} + k_{-17} \cdot x_{389}$
(336) $\dot{x}_{384} = -k_{4b} \cdot x_{384} \cdot x_{12} + k_{-4} \cdot x_{385} + k_{16} \cdot x_{344} \cdot x_{22} - k_{-24} \cdot x_{384} - k_{17} \cdot x_{24} \cdot x_{384} + k_{-17} \cdot x_{390} - k_{105} \cdot x_{384} \cdot x_{426} + k_{-105} \cdot x_{442}$
(337) $\dot{x}_{385} = +k_{4b} \cdot x_{384} \cdot x_{12} - k_{-4} \cdot x_{385} + k_{5b} \cdot x_9 \cdot x_{386} - k_{-5b} \cdot x_{385}$
(338) $\dot{x}_{386} = -k_{5b} \cdot x_9 \cdot x_{386} + k_{-5b} \cdot x_{385} + k_{16} \cdot x_{346} \cdot x_{22} - k_{-63} \cdot x_{386} - k_{17} \cdot x_{24} \cdot x_{386} + k_{-17} \cdot x_{392}$
(339) $\dot{x}_{387} = -k_{4b} \cdot x_{387} \cdot x_{12} + k_{-4} \cdot x_{388} + k_{17} \cdot x_{24} \cdot x_{381} - k_{-17} \cdot x_{387} - k_{18} \cdot x_{26} \cdot x_{387} + k_{-18} \cdot x_{393} - k_{19} \cdot x_{28} \cdot x_{387} + k_{-19} \cdot x_{393} - k_{20} \cdot x_{387} \cdot x_{43} + k_{-20} \cdot x_{399} - k_{21} \cdot x_{387} \cdot x_{26} + k_{-21} \cdot x_{399} + k_{34} \cdot x_{341} \cdot x_{30} - k_{-34} \cdot x_{387}$
(340) $\dot{x}_{388} = +k_{4b} \cdot x_{387} \cdot x_{12} - k_{-4} \cdot x_{388} + k_{5b} \cdot x_9 \cdot x_{389} - k_{-5b} \cdot x_{388}$
(341) $\dot{x}_{389} = -k_{5b} \cdot x_9 \cdot x_{389} + k_{-5b} \cdot x_{388} + k_{17} \cdot x_{24} \cdot x_{383} - k_{-17} \cdot x_{389} - k_{18} \cdot x_{26} \cdot x_{389} + k_{-18} \cdot x_{395} - k_{19} \cdot x_{69} \cdot x_{389} + k_{-19} \cdot x_{395} - k_{20} \cdot x_{389} \cdot x_{71} + k_{-20} \cdot x_{401} - k_{21} \cdot x_{389} \cdot x_{26} + k_{-21} \cdot x_{401} + k_{34} \cdot x_{343} \cdot x_{30} - k_{-34} \cdot x_{389}$
(342) $\dot{x}_{390} = -k_{4b} \cdot x_{390} \cdot x_{12} + k_{-4} \cdot x_{391} + k_{17} \cdot x_{24} \cdot x_{384} - k_{-17} \cdot x_{390} - k_{18} \cdot x_{26} \cdot x_{390} + k_{-18} \cdot x_{396} - k_{19} \cdot x_{28} \cdot x_{390} + k_{-19} \cdot x_{396} - k_{20} \cdot x_{390} \cdot x_{43} + k_{-20} \cdot x_{402} - k_{21} \cdot x_{390} \cdot x_{26} + k_{-21} \cdot x_{402} + k_{34} \cdot x_{344} \cdot x_{30} - k_{-34} \cdot x_{390}$
(343) $\dot{x}_{391} = +k_{4b} \cdot x_{390} \cdot x_{12} - k_{-4} \cdot x_{391} + k_{5b} \cdot x_9 \cdot x_{392} - k_{-5b} \cdot x_{391}$
(344) $\dot{x}_{392} = -k_{5b} \cdot x_9 \cdot x_{392} + k_{-5b} \cdot x_{391} + k_{17} \cdot x_{24} \cdot x_{386} - k_{-17} \cdot x_{392} - k_{18} \cdot x_{26} \cdot x_{392} + k_{-18} \cdot x_{398} - k_{19} \cdot x_{69} \cdot x_{392} + k_{-19} \cdot x_{398} - k_{20} \cdot x_{392} \cdot x_{71} + k_{-20} \cdot x_{404} - k_{21} \cdot x_{392} \cdot x_{26} + k_{-21} \cdot x_{404} + k_{34} \cdot x_{346} \cdot x_{30} - k_{-34} \cdot x_{392}$
(345) $\dot{x}_{393} = -k_{4b} \cdot x_{393} \cdot x_{12} + k_{-4} \cdot x_{394} + k_{18} \cdot x_{26} \cdot x_{387} - k_{-18} \cdot x_{393} + k_{19} \cdot x_{28} \cdot x_{387} - k_{-19} \cdot x_{393}$
(346) $\dot{x}_{394} = +k_{4b} \cdot x_{393} \cdot x_{12} - k_{-4} \cdot x_{394} + k_{5b} \cdot x_9 \cdot x_{395} - k_{-5b} \cdot x_{394}$
(347) $\dot{x}_{395} = -k_{5b} \cdot x_9 \cdot x_{395} + k_{-5b} \cdot x_{394} + k_{18} \cdot x_{26} \cdot x_{389} - k_{-18} \cdot x_{395} + k_{19} \cdot x_{69} \cdot x_{389} - k_{-19} \cdot x_{395}$
(348) $\dot{x}_{396} = -k_{4b} \cdot x_{396} \cdot x_{12} + k_{-4} \cdot x_{397} + k_{18} \cdot x_{26} \cdot x_{390} - k_{-18} \cdot x_{396} + k_{19} \cdot x_{28} \cdot x_{390} - k_{-19} \cdot x_{396}$
(349) $\dot{x}_{397} = +k_{4b} \cdot x_{396} \cdot x_{12} - k_{-4} \cdot x_{397} + k_{5b} \cdot x_9 \cdot x_{398} - k_{-5b} \cdot x_{397}$
(350) $\dot{x}_{398} = -k_{5b} \cdot x_9 \cdot x_{398} + k_{-5b} \cdot x_{397} + k_{18} \cdot x_{26} \cdot x_{392} - k_{-18} \cdot x_{398} + k_{19} \cdot x_{69} \cdot x_{392} - k_{-19} \cdot x_{398}$
(351) $\dot{x}_{399} = -k_{4b} \cdot x_{399} \cdot x_{12} + k_{-4} \cdot x_{400} + k_{20} \cdot x_{387} \cdot x_{43} - k_{-20} \cdot x_{399} + k_{21} \cdot x_{387} \cdot x_{26} - k_{-21} \cdot x_{399}$
(352) $\dot{x}_{400} = +k_{4b} \cdot x_{399} \cdot x_{12} - k_{-4} \cdot x_{400} + k_{5b} \cdot x_9 \cdot x_{401} - k_{-5b} \cdot x_{400}$
(353) $\dot{x}_{401} = -k_{5b} \cdot x_9 \cdot x_{401} + k_{-5b} \cdot x_{400} + k_{20} \cdot x_{389} \cdot x_{71} - k_{-20} \cdot x_{401} + k_{21} \cdot x_{389} \cdot x_{26} - k_{-21} \cdot x_{401}$
(354) $\dot{x}_{402} = -k_{4b} \cdot x_{402} \cdot x_{12} + k_{-4} \cdot x_{403} + k_{20} \cdot x_{390} \cdot x_{43} - k_{-20} \cdot x_{402} + k_{21} \cdot x_{390} \cdot x_{26} - k_{-21} \cdot x_{402}$
(355) $\dot{x}_{403} = +k_{4b} \cdot x_{402} \cdot x_{12} - k_{-4} \cdot x_{403} + k_{5b} \cdot x_9 \cdot x_{404} - k_{-5b} \cdot x_{403}$
(356) $\dot{x}_{404} = -k_{5b} \cdot x_9 \cdot x_{404} + k_{-5b} \cdot x_{403} + k_{20} \cdot x_{392} \cdot x_{71} - k_{-20} \cdot x_{404} + k_{21} \cdot x_{392} \cdot x_{26} - k_{-21} \cdot x_{404}$
(357) $\dot{x}_{405} = +k_{67} \cdot x_{287} \cdot x_{457} - k_{-67} \cdot x_{405} - k_{68} \cdot x_{106} \cdot x_{405} + k_{-68b} \cdot x_{453} - k_{106} \cdot x_{444} \cdot x_{405} + k_{-106} \cdot$

$x_{453} - k_{112} \cdot x_{26} \cdot x_{405} + k_{-112} \cdot x_{269} - k_{113} \cdot x_{28} \cdot x_{405} + k_{-113} \cdot x_{269}$

(358) $\dot{x}_{407} = +k_{117} \cdot x_{521} \cdot x_{487} - k_{-117} \cdot x_{407} + k_{118} \cdot x_{521} \cdot x_{460} - k_{-118} \cdot x_{407}$

(359) $\dot{x}_{408} = +k_{66} \cdot x_{287} \cdot x_{460} - k_{-66} \cdot x_{408} - k_{106} \cdot x_{444} \cdot x_{408} + k_{-106} \cdot x_{455} - k_{112} \cdot x_{26} \cdot x_{408} + k_{-112} \cdot x_{325}$

(360) $\dot{x}_{409} = -k_{111} \cdot x_{59} \cdot x_{409} + k_{-111} \cdot x_{435} - k_{111} \cdot x_{83} \cdot x_{409} + k_{-111} \cdot x_{437} - k_{117} \cdot x_{521} \cdot x_{409} + k_{-117} \cdot x_{411}$

(361) $\dot{x}_{410} = -k_{111} \cdot x_{59} \cdot x_{410} + k_{-111} \cdot x_{438} - k_{111} \cdot x_{83} \cdot x_{410} + k_{-111} \cdot x_{440} - k_{117} \cdot x_{521} \cdot x_{410} + k_{-117} \cdot x_{412}$

(362) $\dot{x}_{411} = +k_{117} \cdot x_{521} \cdot x_{409} - k_{-117} \cdot x_{411} + k_{118} \cdot x_{521} \cdot x_{446} - k_{-118} \cdot x_{411}$

(363) $\dot{x}_{412} = +k_{117} \cdot x_{521} \cdot x_{410} - k_{-117} \cdot x_{412} + k_{118} \cdot x_{521} \cdot x_{447} - k_{-118} \cdot x_{412}$

(364) $\dot{x}_{415} = +k_{94} \cdot x_{280} \cdot x_{8} - k_{-94} \cdot x_{415} + k_{95} \cdot x_{280} \cdot x_{11} - k_{-95} \cdot x_{415}$

(365) $\dot{x}_{416} = +k_{94} \cdot x_{280} \cdot x_{162} - k_{-94} \cdot x_{416} + k_{95} \cdot x_{280} \cdot x_{159} - k_{-95} \cdot x_{416}$

(366) $\dot{x}_{417} = +k_{94} \cdot x_{280} \cdot x_{337} - k_{-94} \cdot x_{417} + k_{95} \cdot x_{280} \cdot x_{339} - k_{-95} \cdot x_{417}$

(367) $\dot{x}_{418} = +k_{94} \cdot x_{280} \cdot x_{338} - k_{-94} \cdot x_{418} + k_{95} \cdot x_{280} \cdot x_{340} - k_{-95} \cdot x_{418}$

(368) $\dot{x}_{419} = -k_{65} \cdot x_{59} \cdot x_{419} + k_{-65} \cdot x_{97} + k_{101} \cdot x_{103} \cdot x_{34} - k_{-101} \cdot x_{419}$

(369) $\dot{x}_{420} = -k_{65} \cdot x_{83} \cdot x_{420} + k_{-65} \cdot x_{98} + k_{101} \cdot x_{103} \cdot x_{65} - k_{-101} \cdot x_{420}$

(370) $\dot{x}_{421} = +k_{120} \cdot x_{157} \cdot x_{155} - k_{-120} \cdot x_{421}$

(371) $\dot{x}_{422} = +k_{120} \cdot x_{155} \cdot x_{158} - k_{-120} \cdot x_{422}$

(372) $\dot{x}_{424} = +k_{117} \cdot x_{521} \cdot x_{430} - k_{-117} \cdot x_{424} + k_{118} \cdot x_{521} \cdot x_{445} - k_{-118} \cdot x_{424}$

(373) $\dot{x}_{425} = -k_{95} \cdot x_{280} \cdot x_{425} + k_{-95} \cdot x_{283}$

(374) $\dot{x}_{426} = -k_{105} \cdot x_{23} \cdot x_{426} + k_{-105} \cdot x_{483} - k_{105} \cdot x_{225} \cdot x_{426} + k_{-105} \cdot x_{427} - k_{105} \cdot x_{226} \cdot x_{426} + k_{-105} \cdot x_{428} - k_{105} \cdot x_{227} \cdot x_{426} + k_{-105} \cdot x_{429} - k_{105} \cdot x_{312} \cdot x_{426} + k_{-105} \cdot x_{436} - k_{105} \cdot x_{381} \cdot x_{426} + k_{-105} \cdot x_{439} - k_{105} \cdot x_{384} \cdot x_{426} + k_{-105} \cdot x_{442}$

(375) $\dot{x}_{427} = -k_{122} \cdot x_{427} \cdot x_{105} + k_{-122} \cdot x_{130} + k_{105} \cdot x_{225} \cdot x_{426} - k_{-105} \cdot x_{427} - k_{108} \cdot x_{463} \cdot x_{427} + k_{-108} \cdot x_{464}$

(376) $\dot{x}_{428} = -k_{122} \cdot x_{428} \cdot x_{105} + k_{-122} \cdot x_{131} + k_{105} \cdot x_{226} \cdot x_{426} - k_{-105} \cdot x_{428} - k_{108} \cdot x_{463} \cdot x_{428} + k_{-108} \cdot x_{465}$

(377) $\dot{x}_{429} = -k_{122} \cdot x_{429} \cdot x_{105} + k_{-122} \cdot x_{132} + k_{105} \cdot x_{227} \cdot x_{426} - k_{-105} \cdot x_{429} - k_{108} \cdot x_{463} \cdot x_{429} + k_{-108} \cdot x_{466}$

(378) $\dot{x}_{430} = -k_{111} \cdot x_{59} \cdot x_{430} + k_{-111} \cdot x_{433} - k_{111} \cdot x_{83} \cdot x_{430} + k_{-111} \cdot x_{434} - k_{117} \cdot x_{521} \cdot x_{430} + k_{-117} \cdot x_{424}$

(379) $\dot{x}_{431} = +k_{110} \cdot x_{59} \cdot x_{486} - k_{-110} \cdot x_{431} + k_{111} \cdot x_{59} \cdot x_{488} - k_{-111} \cdot x_{431}$

(380) $\dot{x}_{432} = +k_{110} \cdot x_{83} \cdot x_{486} - k_{-110} \cdot x_{432} + k_{111} \cdot x_{83} \cdot x_{488} - k_{-111} \cdot x_{432}$

(381) $\dot{x}_{433} = +k_{110} \cdot x_{59} \cdot x_{445} - k_{-110} \cdot x_{433} + k_{111} \cdot x_{59} \cdot x_{430} - k_{-111} \cdot x_{433}$

(382) $\dot{x}_{434} = +k_{110} \cdot x_{83} \cdot x_{445} - k_{-110} \cdot x_{434} + k_{111} \cdot x_{83} \cdot x_{430} - k_{-111} \cdot x_{434}$

(383) $\dot{x}_{435} = +k_{110} \cdot x_{59} \cdot x_{446} - k_{-110} \cdot x_{435} + k_{111} \cdot x_{59} \cdot x_{409} - k_{-111} \cdot x_{435}$

(384) $\dot{x}_{436} = -k_{122} \cdot x_{436} \cdot x_{105} + k_{-122} \cdot x_{133} + k_{105} \cdot x_{312} \cdot x_{426} - k_{-105} \cdot x_{436} - k_{108} \cdot x_{463} \cdot x_{436} + k_{-108} \cdot x_{473}$

(385) $\dot{x}_{437} = +k_{110} \cdot x_{83} \cdot x_{446} - k_{-110} \cdot x_{437} + k_{111} \cdot x_{83} \cdot x_{409} - k_{-111} \cdot x_{437}$

(386) $\dot{x}_{438} = +k_{110} \cdot x_{59} \cdot x_{447} - k_{-110} \cdot x_{438} + k_{111} \cdot x_{59} \cdot x_{410} - k_{-111} \cdot x_{438}$

(387) $\dot{x}_{439} = -k_{122} \cdot x_{439} \cdot x_{105} + k_{-122} \cdot x_{134} + k_{105} \cdot x_{381} \cdot x_{426} - k_{-105} \cdot x_{439} - k_{108} \cdot x_{463} \cdot x_{439} + k_{-108} \cdot x_{476}$

(388) $\dot{x}_{440} = +k_{110} \cdot x_{83} \cdot x_{447} - k_{-110} \cdot x_{440} + k_{111} \cdot x_{83} \cdot x_{410} - k_{-111} \cdot x_{440}$

(389) $\dot{x}_{442} = -k_{122} \cdot x_{442} \cdot x_{105} + k_{-122} \cdot x_{135} + k_{105} \cdot x_{384} \cdot x_{426} - k_{-105} \cdot x_{442} - k_{108} \cdot x_{463} \cdot x_{442} + k_{-108} \cdot x_{479}$

(390) $\dot{x}_{444} = -k_{104} \cdot x_{461} \cdot x_{444} + k_{-104} \cdot x_{462} - k_{104} \cdot x_{279} \cdot x_{444} + k_{-104} \cdot x_{482} - k_{106b} \cdot x_{444} \cdot x_{104} + k_{-106b} \cdot x_{448} - k_{106b} \cdot x_{444} \cdot x_{261} + k_{-106b} \cdot x_{449} - k_{106b} \cdot x_{444} \cdot x_{262} + k_{-106b} \cdot x_{450} - k_{106b} \cdot x_{444} \cdot x_{263} + k_{-106b} \cdot x_{451} - k_{106} \cdot x_{444} \cdot x_{324} + k_{-106} \cdot x_{452} - k_{106} \cdot x_{444} \cdot x_{405} + k_{-106} \cdot x_{453} - k_{106} \cdot x_{444} \cdot x_{408} + k_{-106} \cdot x_{455} - k_{106} \cdot x_{444} \cdot x_{453} + k_{-106} \cdot x_{467} - k_{106} \cdot x_{444} \cdot x_{467} + k_{-106} \cdot x_{468} - k_{106} \cdot x_{444} \cdot x_{468} + k_{-106} \cdot x_{469} - k_{106} \cdot x_{444} \cdot x_{469} + k_{-106} \cdot x_{470} - k_{106} \cdot x_{444} \cdot x_{470} + k_{-106} \cdot x_{471}$

(391) $\dot{x}_{445} = -k_{66} \cdot x_{287} \cdot x_{445} + k_{-66} \cdot x_{261} - k_{107} \cdot x_{463} \cdot x_{445} + k_{-107} \cdot x_{464} - k_{110} \cdot x_{59} \cdot x_{445} + k_{-110} \cdot x_{433} - k_{110} \cdot x_{83} \cdot x_{445} + k_{-110} \cdot x_{434} - k_{118} \cdot x_{521} \cdot x_{445} + k_{-118} \cdot x_{424} - k_{123} \cdot x_{445} \cdot x_{105} + k_{-123} \cdot x_{130}$

(392) $\dot{x}_{446} = -k_{67} \cdot x_{287} \cdot x_{446} + k_{-67} \cdot x_{262} - k_{107} \cdot x_{463} \cdot x_{446} + k_{-107} \cdot x_{465} - k_{110} \cdot x_{59} \cdot x_{446} + k_{-110} \cdot x_{435} - k_{110} \cdot x_{83} \cdot x_{446} + k_{-110} \cdot x_{437} - k_{118} \cdot x_{521} \cdot x_{446} + k_{-118} \cdot x_{411} - k_{123} \cdot x_{446} \cdot x_{105} + k_{-123} \cdot x_{131}$

(393) $\dot{x}_{447} = -k_{66} \cdot x_{287} \cdot x_{447} + k_{-66} \cdot x_{263} - k_{107} \cdot x_{463} \cdot x_{447} + k_{-107} \cdot x_{466} - k_{110} \cdot x_{59} \cdot x_{447} + k_{-110} \cdot x_{438} - k_{110} \cdot x_{83} \cdot x_{447} + k_{-110} \cdot x_{440} - k_{118} \cdot x_{521} \cdot x_{447} + k_{-118} \cdot x_{412} - k_{123} \cdot x_{447} \cdot x_{105} + k_{-123} \cdot x_{132}$

(394) $\dot{x}_{448} = +k_{68} \cdot x_{104} \cdot x_{106} - k_{-68} \cdot x_{448} + k_{106b} \cdot x_{444} \cdot x_{104} - k_{-106b} \cdot x_{448}$
(395) $\dot{x}_{449} = +k_{68} \cdot x_{106} \cdot x_{261} - k_{-68} \cdot x_{449} + k_{106b} \cdot x_{444} \cdot x_{261} - k_{-106b} \cdot x_{449}$
(396) $\dot{x}_{450} = +k_{68} \cdot x_{106} \cdot x_{262} - k_{-68} \cdot x_{450} + k_{106b} \cdot x_{444} \cdot x_{262} - k_{-106b} \cdot x_{450}$
(397) $\dot{x}_{451} = +k_{68} \cdot x_{106} \cdot x_{263} - k_{-68} \cdot x_{451} + k_{106b} \cdot x_{444} \cdot x_{263} - k_{-106b} \cdot x_{451}$
(398) $\dot{x}_{452} = +k_{68} \cdot x_{106} \cdot x_{324} - k_{-68} \cdot x_{452} + k_{106} \cdot x_{444} \cdot x_{324} - k_{-106} \cdot x_{452}$
(399) $\dot{x}_{453} = +k_{68} \cdot x_{106} \cdot x_{405} - k_{-68b} \cdot x_{453} - k_{68} \cdot x_{106} \cdot x_{453} + k_{-68b} \cdot x_{467} + k_{106} \cdot x_{444} \cdot x_{405} - k_{-106} \cdot x_{453} - k_{106} \cdot x_{444} \cdot x_{453} + k_{-106} \cdot x_{467}$
(400) $\dot{x}_{454} = -k_{67} \cdot x_{287} \cdot x_{454} + k_{-67} \cdot x_{324} - k_{107} \cdot x_{463} \cdot x_{454} + k_{-107} \cdot x_{473} - k_{110} \cdot x_{59} \cdot x_{454} + k_{-110} \cdot x_{474} - k_{110} \cdot x_{83} \cdot x_{454} + k_{-110} \cdot x_{475} - k_{118} \cdot x_{521} \cdot x_{454} + k_{-118} \cdot x_{523} - k_{123} \cdot x_{454} \cdot x_{105} + k_{-123} \cdot x_{133}$
(401) $\dot{x}_{455} = +k_{106} \cdot x_{444} \cdot x_{408} - k_{-106} \cdot x_{455}$
(402) $\dot{x}_{456} = +k_{117} \cdot x_{521} \cdot x_{491} - k_{-117} \cdot x_{456} + k_{118} \cdot x_{521} \cdot x_{457} - k_{-118} \cdot x_{456}$
(403) $\dot{x}_{457} = -k_{67} \cdot x_{287} \cdot x_{457} + k_{-67} \cdot x_{405} - k_{107} \cdot x_{463} \cdot x_{457} + k_{-107} \cdot x_{476} - k_{110} \cdot x_{59} \cdot x_{457} + k_{-110} \cdot x_{477} - k_{110} \cdot x_{83} \cdot x_{457} + k_{-110} \cdot x_{478} - k_{118} \cdot x_{521} \cdot x_{457} + k_{-118} \cdot x_{456} - k_{123} \cdot x_{457} \cdot x_{105} + k_{-123} \cdot x_{134}$
(404) $\dot{x}_{460} = -k_{66} \cdot x_{287} \cdot x_{460} + k_{-66} \cdot x_{408} - k_{107} \cdot x_{463} \cdot x_{460} + k_{-107} \cdot x_{479} - k_{110} \cdot x_{59} \cdot x_{460} + k_{-110} \cdot x_{480} - k_{110} \cdot x_{83} \cdot x_{460} + k_{-110} \cdot x_{481} - k_{118} \cdot x_{521} \cdot x_{460} + k_{-118} \cdot x_{407} - k_{123} \cdot x_{460} \cdot x_{105} + k_{-123} \cdot x_{135}$
(405) $\dot{x}_{461} = -k_{104} \cdot x_{461} \cdot x_{444} + k_{-104} \cdot x_{462} - k_{109} \cdot x_{106} \cdot x_{461} + k_{-109} \cdot x_{462}$
(406) $\dot{x}_{462} = +k_{104} \cdot x_{461} \cdot x_{444} - k_{-104} \cdot x_{462} + k_{109} \cdot x_{106} \cdot x_{461} - k_{-109} \cdot x_{462}$
(407) $\dot{x}_{463} = -k_{107} \cdot x_{463} \cdot x_{445} + k_{-107} \cdot x_{464} - k_{107} \cdot x_{463} \cdot x_{446} + k_{-107} \cdot x_{465} - k_{107} \cdot x_{463} \cdot x_{447} + k_{-107} \cdot x_{466} - k_{107} \cdot x_{463} \cdot x_{454} + k_{-107} \cdot x_{473} - k_{107} \cdot x_{463} \cdot x_{457} + k_{-107} \cdot x_{476} - k_{107} \cdot x_{463} \cdot x_{460} + k_{-107} \cdot x_{479} - k_{107} \cdot x_{463} \cdot x_{486} + k_{-107} \cdot x_{489} - k_{108} \cdot x_{463} \cdot x_{427} + k_{-108} \cdot x_{464} - k_{108} \cdot x_{463} \cdot x_{428} + k_{-108} \cdot x_{465} - k_{108} \cdot x_{463} \cdot x_{429} + k_{-108} \cdot x_{466} - k_{108} \cdot x_{463} \cdot x_{436} + k_{-108} \cdot x_{473} - k_{108} \cdot x_{463} \cdot x_{439} + k_{-108} \cdot x_{476} - k_{108} \cdot x_{463} \cdot x_{442} + k_{-108} \cdot x_{479} - k_{108} \cdot x_{463} \cdot x_{483} + k_{-108} \cdot x_{489}$
(408) $\dot{x}_{464} = +k_{107} \cdot x_{463} \cdot x_{445} - k_{-107} \cdot x_{464} + k_{108} \cdot x_{463} \cdot x_{427} - k_{-108} \cdot x_{464}$
(409) $\dot{x}_{465} = +k_{107} \cdot x_{463} \cdot x_{446} - k_{-107} \cdot x_{465} + k_{108} \cdot x_{463} \cdot x_{428} - k_{-108} \cdot x_{465}$
(410) $\dot{x}_{466} = +k_{107} \cdot x_{463} \cdot x_{447} - k_{-107} \cdot x_{466} + k_{108} \cdot x_{463} \cdot x_{429} - k_{-108} \cdot x_{466}$
(411) $\dot{x}_{467} = +k_{68} \cdot x_{106} \cdot x_{453} - k_{-68b} \cdot x_{467} - k_{68} \cdot x_{106} \cdot x_{467} + k_{-68b} \cdot x_{468} + k_{106} \cdot x_{444} \cdot x_{453} - k_{-106} \cdot x_{467} - k_{106} \cdot x_{444} \cdot x_{467} + k_{-106} \cdot x_{468}$
(412) $\dot{x}_{468} = +k_{68} \cdot x_{106} \cdot x_{467} - k_{-68b} \cdot x_{468} - k_{68} \cdot x_{106} \cdot x_{468} + k_{-68b} \cdot x_{469} + k_{106} \cdot x_{444} \cdot x_{467} - k_{-106} \cdot x_{468} - k_{106} \cdot x_{444} \cdot x_{468} + k_{-106} \cdot x_{469}$
(413) $\dot{x}_{469} = +k_{68} \cdot x_{106} \cdot x_{468} - k_{-68b} \cdot x_{469} - k_{68} \cdot x_{106} \cdot x_{469} + k_{-68b} \cdot x_{470} + k_{106} \cdot x_{444} \cdot x_{468} - k_{-106} \cdot x_{469} - k_{106} \cdot x_{444} \cdot x_{469} + k_{-106} \cdot x_{470}$
(414) $\dot{x}_{470} = +k_{68} \cdot x_{106} \cdot x_{469} - k_{-68b} \cdot x_{470} - k_{68} \cdot x_{106} \cdot x_{470} + k_{-68b} \cdot x_{471} + k_{106} \cdot x_{444} \cdot x_{469} - k_{-106} \cdot x_{470} - k_{106} \cdot x_{444} \cdot x_{470} + k_{-106} \cdot x_{471}$
(415) $\dot{x}_{471} = +k_{68} \cdot x_{106} \cdot x_{470} - k_{-68b} \cdot x_{471} + k_{106} \cdot x_{444} \cdot x_{470} - k_{-106} \cdot x_{471}$
(416) $\dot{x}_{472} = +k_{114} \cdot x_{497} \cdot x_{45} - k_{-114} \cdot x_{472} + k_{115} \cdot x_{485} \cdot x_{497} - k_{-115} \cdot x_{472}$
(417) $\dot{x}_{473} = +k_{107} \cdot x_{463} \cdot x_{454} - k_{-107} \cdot x_{473} + k_{108} \cdot x_{463} \cdot x_{436} - k_{-108} \cdot x_{473}$
(418) $\dot{x}_{474} = +k_{110} \cdot x_{59} \cdot x_{454} - k_{-110} \cdot x_{474} + k_{111} \cdot x_{59} \cdot x_{490} - k_{-111} \cdot x_{474}$
(419) $\dot{x}_{475} = +k_{110} \cdot x_{83} \cdot x_{454} - k_{-110} \cdot x_{475} + k_{111} \cdot x_{83} \cdot x_{490} - k_{-111} \cdot x_{475}$
(420) $\dot{x}_{476} = +k_{107} \cdot x_{463} \cdot x_{457} - k_{-107} \cdot x_{476} + k_{108} \cdot x_{463} \cdot x_{439} - k_{-108} \cdot x_{476}$
(421) $\dot{x}_{477} = +k_{110} \cdot x_{59} \cdot x_{457} - k_{-110} \cdot x_{477} + k_{111} \cdot x_{59} \cdot x_{491} - k_{-111} \cdot x_{477}$
(422) $\dot{x}_{478} = +k_{110} \cdot x_{83} \cdot x_{457} - k_{-110} \cdot x_{478} + k_{111} \cdot x_{83} \cdot x_{491} - k_{-111} \cdot x_{478}$
(423) $\dot{x}_{479} = +k_{107} \cdot x_{463} \cdot x_{460} - k_{-107} \cdot x_{479} + k_{108} \cdot x_{463} \cdot x_{442} - k_{-108} \cdot x_{479} - k_{113} \cdot x_{28} \cdot x_{479} + k_{-113} \cdot x_{325}$
(424) $\dot{x}_{480} = +k_{110} \cdot x_{59} \cdot x_{460} - k_{-110} \cdot x_{480} + k_{111} \cdot x_{59} \cdot x_{487} - k_{-111} \cdot x_{480}$
(425) $\dot{x}_{481} = +k_{110} \cdot x_{83} \cdot x_{460} - k_{-110} \cdot x_{481} + k_{111} \cdot x_{83} \cdot x_{487} - k_{-111} \cdot x_{481}$
(426) $\dot{x}_{482} = +k_{104} \cdot x_{279} \cdot x_{444} - k_{-104} \cdot x_{482} + k_{109} \cdot x_{106} \cdot x_{279} - k_{-109} \cdot x_{482}$
(427) $\dot{x}_{483} = -k_{122} \cdot x_{483} \cdot x_{105} + k_{-122} \cdot x_{136} + k_{105} \cdot x_{23} \cdot x_{426} - k_{-105} \cdot x_{483} - k_{108} \cdot x_{463} \cdot x_{483} + k_{-108} \cdot x_{489}$

(428) $\dot{x}_{484} = +k_{114} \cdot x_{497} \cdot x_{72} - k_{-114} \cdot x_{484} + k_{115} \cdot x_{485} \cdot x_{497} - k_{-115} \cdot x_{484}$
(429) $\dot{x}_{485} = -k_{115} \cdot x_{485} \cdot x_{497} + k_{-115} \cdot x_{472} - k_{115} \cdot x_{485} \cdot x_{497} + k_{-115} \cdot x_{484} - k_{116} \cdot x_{485} + k_{-116} \cdot x_{497}$
(430) $\dot{x}_{486} = -k_{66} \cdot x_{287} \cdot x_{486} + k_{-66} \cdot x_{104} - k_{107} \cdot x_{463} \cdot x_{486} + k_{-107} \cdot x_{489} - k_{110} \cdot x_{59} \cdot x_{486} + k_{-110} \cdot x_{431} - k_{110} \cdot x_{83} \cdot x_{486} + k_{-110} \cdot x_{432} - k_{118} \cdot x_{521} \cdot x_{486} + k_{-118} \cdot x_{522} - k_{123} \cdot x_{486} \cdot x_{105} + k_{-123} \cdot x_{136}$
(431) $\dot{x}_{487} = -k_{111} \cdot x_{59} \cdot x_{487} + k_{-111} \cdot x_{480} - k_{111} \cdot x_{83} \cdot x_{487} + k_{-111} \cdot x_{481} - k_{117} \cdot x_{521} \cdot x_{487} + k_{-117} \cdot x_{407}$
(432) $\dot{x}_{488} = -k_{111} \cdot x_{59} \cdot x_{488} + k_{-111} \cdot x_{431} - k_{111} \cdot x_{83} \cdot x_{488} + k_{-111} \cdot x_{432} - k_{117} \cdot x_{521} \cdot x_{488} + k_{-117} \cdot x_{522}$
(433) $\dot{x}_{489} = +k_{107} \cdot x_{463} \cdot x_{486} - k_{-107} \cdot x_{489} + k_{108} \cdot x_{463} \cdot x_{483} - k_{-108} \cdot x_{489}$
(434) $\dot{x}_{490} = -k_{111} \cdot x_{59} \cdot x_{490} + k_{-111} \cdot x_{474} - k_{111} \cdot x_{83} \cdot x_{490} + k_{-111} \cdot x_{475} - k_{117} \cdot x_{521} \cdot x_{490} + k_{-117} \cdot x_{523}$
(435) $\dot{x}_{491} = -k_{111} \cdot x_{59} \cdot x_{491} + k_{-111} \cdot x_{477} - k_{111} \cdot x_{83} \cdot x_{491} + k_{-111} \cdot x_{478} - k_{117} \cdot x_{521} \cdot x_{491} + k_{-117} \cdot x_{456}$
(436) $\dot{x}_{492} = +k_{2b} \cdot x_{499} \cdot x_{141} - k_{-2b} \cdot x_{492}$
(437) $\dot{x}_{493} = +k_{2b} \cdot x_{140} \cdot x_{499} - k_{-2b} \cdot x_{493}$
(438) $\dot{x}_{494} = +k_{2b} \cdot x_{143} \cdot x_{499} - k_{-2b} \cdot x_{494}$
(439) $\dot{x}_{495} = +k_{69} \cdot x_{106} \cdot x_{112} - k_{-69} \cdot x_{495} - k_{70} \cdot x_{109} \cdot x_{495} + k_{-70} \cdot x_{496}$
(440) $\dot{x}_{496} = +k_{70} \cdot x_{109} \cdot x_{495} - k_{-70} \cdot x_{496} + k_{72} \cdot x_{497} \cdot x_{111} - k_{-72} \cdot x_{496}$
(441) $\dot{x}_{497} = -k_{72} \cdot x_{497} \cdot x_{111} + k_{-72} \cdot x_{496} - k_{74} \cdot x_{497} \cdot x_{113} + k_{-74} \cdot x_{498} - k_{114} \cdot x_{497} \cdot x_{45} + k_{-114} \cdot x_{472} - k_{114} \cdot x_{497} \cdot x_{72} + k_{-114} \cdot x_{484} - k_{115} \cdot x_{485} \cdot x_{497} + k_{-115} \cdot x_{472} - k_{115} \cdot x_{485} \cdot x_{497} + k_{-115} \cdot x_{484} + k_{116} \cdot x_{485} - k_{-116} \cdot x_{497}$
(442) $\dot{x}_{498} = +k_{74} \cdot x_{497} \cdot x_{113} - k_{-74} \cdot x_{498} + k_{75} \cdot x_{112} \cdot x_{113} - k_{-75} \cdot x_{498}$
(443) $\dot{x}_{499} = +k_1 \cdot x_1 \cdot x_{286} - k_{-1} \cdot x_{499} - k_2 \cdot x_3 \cdot x_{499} + k_{-2} \cdot x_{500} - k_2 \cdot x_{499} \cdot x_{499} + k_{-2} \cdot x_{501} - k_2 \cdot x_{499} \cdot x_{499} + k_{-2} \cdot x_{501} - k_{2b} \cdot x_{499} \cdot x_{141} + k_{-2b} \cdot x_{492} - k_{2b} \cdot x_{140} \cdot x_{499} + k_{-2b} \cdot x_{493} - k_{2b} \cdot x_{143} \cdot x_{499} + k_{-2b} \cdot x_{494} - k_2 \cdot x_{529} \cdot x_{499} + k_{-2} \cdot x_{535} - k_2 \cdot x_{499} \cdot x_{526} + k_{-2} \cdot x_{537} - k_{124} \cdot x_{499} + k_{-124} \cdot x_{526} - k_{124} \cdot x_{499} + k_{-124} \cdot x_{526} - k_{124} \cdot x_{499} + k_{-124} \cdot x_{526}$
(444) $\dot{x}_{500} = +k_2 \cdot x_3 \cdot x_{499} - k_{-2} \cdot x_{500}$
(445) $\dot{x}_{501} = +k_2 \cdot x_{499} \cdot x_{499} - k_{-2} \cdot x_{501}$
(446) $\dot{x}_{502} = -k_{2b} \cdot x_3 \cdot x_{502} + k_{-2b} \cdot x_{504} + k_{98} \cdot x_{141} \cdot x_{285} - k_{-98} \cdot x_{502} - k_{103} \cdot x_{87} \cdot x_{502} + k_{-103} \cdot x_{509} - k_{103} \cdot x_{502} \cdot x_{140} + k_{-103} \cdot x_{510} - k_{103} \cdot x_{502} \cdot x_{143} + k_{-103} \cdot x_{511}$
(447) $\dot{x}_{503} = -k_{2b} \cdot x_3 \cdot x_{503} + k_{-2b} \cdot x_{505} + k_{99} \cdot x_{143} \cdot x_{285} - k_{-99} \cdot x_{503} - k_{103} \cdot x_{141} \cdot x_{503} + k_{-103} \cdot x_{513}$
(448) $\dot{x}_{504} = +k_{2b} \cdot x_3 \cdot x_{502} - k_{-2b} \cdot x_{504}$
(449) $\dot{x}_{505} = +k_{2b} \cdot x_3 \cdot x_{503} - k_{-2b} \cdot x_{505}$
(450) $\dot{x}_{506} = -k_{2b} \cdot x_3 \cdot x_{506} + k_{-2b} \cdot x_{507} + k_{100} \cdot x_{140} \cdot x_{285} - k_{-100} \cdot x_{506}$
(451) $\dot{x}_{507} = +k_{2b} \cdot x_3 \cdot x_{506} - k_{-2b} \cdot x_{507}$
(452) $\dot{x}_{509} = +k_{103} \cdot x_{87} \cdot x_{502} - k_{-103} \cdot x_{509}$
(453) $\dot{x}_{510} = +k_{103} \cdot x_{502} \cdot x_{140} - k_{-103} \cdot x_{510}$
(454) $\dot{x}_{511} = +k_{103} \cdot x_{502} \cdot x_{143} - k_{-103} \cdot x_{511}$
(455) $\dot{x}_{513} = +k_{103} \cdot x_{141} \cdot x_{503} - k_{-103} \cdot x_{513}$
(456) $\dot{x}_{514} = -k_{119} \cdot x_{514} \cdot x_{140} + k_{-119} \cdot x_{142} - k_{119} \cdot x_{143} \cdot x_{514} + k_{-119} \cdot x_{144}$
(457) $\dot{x}_{515} = -k_{10b} \cdot x_{154} \cdot x_{515} + k_{-10} \cdot x_{157} + k_{15} \cdot x_{154} - k_{-15} \cdot x_{515}$
(458) $\dot{x}_{516} = +k_{120b} \cdot x_{142} \cdot x_2 - k_{-120} \cdot x_{516}$
(459) $\dot{x}_{517} = +k_{120b} \cdot x_{144} \cdot x_2 - k_{-120} \cdot x_{517}$
(460) $\dot{x}_{518} = +k_{120b} \cdot x_6 \cdot x_{157} - k_{-120} \cdot x_{518}$
(461) $\dot{x}_{519} = +k_{120b} \cdot x_6 \cdot x_{158} - k_{-120} \cdot x_{519}$
(462) $\dot{x}_{521} = -k_{117} \cdot x_{521} \cdot x_{488} + k_{-117} \cdot x_{522} - k_{117} \cdot x_{521} \cdot x_{490} + k_{-117} \cdot x_{523} - k_{117} \cdot x_{521} \cdot x_{409} + k_{-117} \cdot x_{411} - k_{117} \cdot x_{521} \cdot x_{410} + k_{-117} \cdot x_{412} - k_{117} \cdot x_{521} \cdot x_{491} + k_{-117} \cdot x_{456} - k_{117} \cdot x_{521} \cdot x_{430} + k_{-117} \cdot x_{424} - k_{117} \cdot x_{521} \cdot x_{487} + k_{-117} \cdot x_{407} - k_{118} \cdot x_{521} \cdot x_{486} + k_{-118} \cdot x_{522} - k_{118} \cdot x_{521} \cdot x_{454} + k_{-118} \cdot x_{523} - k_{118} \cdot x_{521} \cdot x_{446} + k_{-118} \cdot x_{411} - k_{118} \cdot x_{521} \cdot x_{447} + k_{-118} \cdot x_{412} - k_{118} \cdot x_{521} \cdot x_{457} + k_{-118} \cdot x_{456} - k_{118} \cdot x_{521} \cdot x_{445} + k_{-118} \cdot x_{424} - k_{118} \cdot x_{521} \cdot x_{460} + k_{-118} \cdot x_{407}$
(463) $\dot{x}_{522} = +k_{117} \cdot x_{521} \cdot x_{488} - k_{-117} \cdot x_{522} + k_{118} \cdot x_{521} \cdot x_{486} - k_{-118} \cdot x_{522}$

(464) $\dot{x}_{523} = +k_{117} \cdot x_{521} \cdot x_{490} - k_{-117} \cdot x_{523} + k_{118} \cdot x_{521} \cdot x_{454} - k_{-118} \cdot x_{523}$

(465) $\dot{x}_{524} = -k_{1} \cdot x_{1} \cdot x_{524} + k_{-1} \cdot x_{529} + k_{6} \cdot x_{1} - k_{-6} \cdot x_{524} + k_{122m} \cdot x_{532} \cdot x_{105} - k_{-122} \cdot x_{524}$

(466) $\dot{x}_{525} = +k_{97c} \cdot x_{532} \cdot x_{285} - k_{-97c} \cdot x_{525} - k_{1} \cdot x_{1} \cdot x_{525} + k_{-1} \cdot x_{526}$

(467) $\dot{x}_{526} = +k_{1} \cdot x_{1} \cdot x_{525} - k_{-1} \cdot x_{526} - k_{2} \cdot x_{3} \cdot x_{526} + k_{-2} \cdot x_{527} - k_{2} \cdot x_{526} \cdot x_{526} + k_{-2} \cdot x_{528} - k_{2} \cdot x_{526} \cdot x_{526} + k_{-2} \cdot x_{528} - k_{2} \cdot x_{529} \cdot x_{526} + k_{-2} \cdot x_{536} - k_{2} \cdot x_{499} \cdot x_{526} + k_{-2} \cdot x_{537} + k_{124} \cdot x_{499} - k_{-124} \cdot x_{526} + k_{124} \cdot x_{499} - k_{-124} \cdot x_{526} + k_{124} \cdot x_{499} - k_{-124} \cdot x_{526}$

(468) $\dot{x}_{527} = +k_{2} \cdot x_{3} \cdot x_{526} - k_{-2} \cdot x_{527}$

(469) $\dot{x}_{528} = +k_{2} \cdot x_{526} \cdot x_{526} - k_{-2} \cdot x_{528}$

(470) $\dot{x}_{529} = +k_{1} \cdot x_{1} \cdot x_{524} - k_{-1} \cdot x_{529} - k_{2} \cdot x_{529} \cdot x_{529} + k_{-2} \cdot x_{533} - k_{2} \cdot x_{529} \cdot x_{529} + k_{-2} \cdot x_{533} + k_{124} \cdot x_{529} - k_{-124} \cdot x_{529} - k_{124} \cdot x_{529} + k_{-124} \cdot x_{529} - k_{2} \cdot x_{3} \cdot x_{529} + k_{-2} \cdot x_{534} - k_{2} \cdot x_{529} \cdot x_{499} + k_{-2} \cdot x_{535} - k_{2} \cdot x_{529} \cdot x_{526} + k_{-2} \cdot x_{536}$

(471) $\dot{x}_{530} = -k_{10b} \cdot x_{530} \cdot x_{16} + k_{-10} \cdot x_{10}$

(472) $\dot{x}_{531} = -k_{97} \cdot x_{531} \cdot x_{285} + k_{-97} \cdot x_{286} - k_{122} \cdot x_{531} \cdot x_{105} + k_{-122} \cdot x_{2}$

(473) $\dot{x}_{532} = -k_{97c} \cdot x_{532} \cdot x_{285} + k_{-97c} \cdot x_{525} - k_{122m} \cdot x_{532} \cdot x_{105} + k_{-122} \cdot x_{524} - k_{124} \cdot x_{532} + k_{-124} \cdot x_{105} - k_{124} \cdot x_{532} + k_{-124} \cdot x_{105} - k_{124} \cdot x_{532} + k_{-124} \cdot x_{105} - k_{124} \cdot x_{532} + k_{-124} \cdot x_{105} - k_{124} \cdot x_{532} + k_{-124} \cdot x_{105} - k_{124} \cdot x_{532} + k_{-124} \cdot x_{105} - k_{124} \cdot x_{532} + k_{-124} \cdot x_{105} - k_{124} \cdot x_{532} + k_{-124} \cdot x_{105} - k_{124} \cdot x_{532} + k_{-124} \cdot x_{105} - k_{124} \cdot x_{532} + k_{-124} \cdot x_{105} - k_{124} \cdot x_{532} + k_{-124} \cdot x_{105} - k_{124} \cdot x_{532} + k_{-124} \cdot x_{105} - k_{124} \cdot x_{532} + k_{-124} \cdot x_{105} - k_{124} \cdot x_{532} + k_{-124} \cdot x_{105} - k_{124} \cdot x_{532} + k_{-124} \cdot x_{105} - k_{124} \cdot x_{532} + k_{-124} \cdot x_{105} - k_{124} \cdot x_{532} + k_{-124} \cdot x_{105}$

(474) $\dot{x}_{533} = +k_{2} \cdot x_{529} \cdot x_{529} - k_{-2} \cdot x_{533}$

(475) $\dot{x}_{534} = +k_{2} \cdot x_{3} \cdot x_{529} - k_{-2} \cdot x_{534}$

(476) $\dot{x}_{535} = +k_{2} \cdot x_{529} \cdot x_{499} - k_{-2} \cdot x_{535}$

(477) $\dot{x}_{536} = +k_{2} \cdot x_{529} \cdot x_{526} - k_{-2} \cdot x_{536}$

(478) $\dot{x}_{537} = +k_{2} \cdot x_{499} \cdot x_{526} - k_{-2} \cdot x_{537}$

B

x_1 EGF 5e-9
x_2 ErbB1:ATP 0
x_3 EGF:ErbB1:ATP 0
x_4 2(EGF:ErbB1:ATP) 0
x_5 2(EGF:ErbB1)#P 0
x_6 ErbB1:ATP 0
x_7 2(EGF:ErbB1)#P:GAP:Grb2:cPP 0
x_8 2(EGF:ErbB1)#P 0
x_9 cPP 0
x_{10} EGF:ErbB1:ATP 0
x_{11} 2(EGF:ErbB1:ATP) 0
x_{12} cPP 4498.73
x_{13} EGF degraded 0
x_{14} GAP 534751
x_{15} 2(EGF:ErbB1)#P:GAP 0
x_{16} EGF 0
x_{17} 2(EGF:ErbB1)#P:GAP 0
x_{18} 2(EGF:ErbB1)#P:GAP:Grb2 0
x_{19} 2(EGF:ErbB1)#P:GAP:Grb2:Sos 0
x_{20} 2(EGF:ErbB1)#P:GAP:Grb2:Sos:(Ras:GDP) 0
x_{21} 2(EGF:ErbB1)#P:GAP:Grb2:Sos:(Ras:GTP) 0
x_{22} Grb2 1264.91
x_{23} 2(EGF:ErbB1)#P:GAP:Grb2 0
x_{24} Sos 0
x_{25} 2(EGF:ErbB1)#P:GAP:Grb2:Sos 0
x_{26} Ras:GDP 58095.2
x_{27} 2(EGF:ErbB1)#P:GAP:Grb2:Sos:(Ras:GDP) 0
x_{28} Ras:GTP 0
x_{29} 2(EGF:ErbB1)#P:GAP:Grb2:Sos:(Ras:GTP) 0
x_{30} Grb2:Sos 8.8914e+07
x_{31} Shc 1100000
x_{32} 2(EGF:ErbB1)#P:GAP:Shc 0
x_{33} 2(EGF:ErbB1)#P:GAP:(Shc#P) 0
x_{34} 2(EGF:ErbB1)#P:GAP:(Shc#P):Grb2 0
x_{35} 2(EGF:ErbB1)#P:GAP:(Shc#P):Grb2:Sos 0
x_{36} 2(EGF:ErbB1)#P:GAP:(Shc#P):Grb2:Sos:(Ras:GDP) 0
x_{37} 2(EGF:ErbB1)#P:GAP:(Shc#P):Grb2:Sos:(Ras:GTP) 0
x_{38} (Shc#P):Grb2:Sos 0
x_{39} (Shc#P):Grb2 0
x_{40} (Shc#P) 0
x_{41} Raf 71131.2
x_{42} Raf:Ras:GTP 0
x_{43} Ras activated:GTP 0

x_{44} PP2A(I) 50000
x_{45} Raf#P 0
x_{46} Raf#P:Pase1 0
x_{47} MEK 3020000
x_{48} MEK:Raf#P 0
x_{49} MEK#P 0
x_{50} MEK#P:Raf#P 0
x_{51} MEK#P#P 0
x_{52} MEK#P#P:Pase2 0
x_{53} PP2A(II) 124480
x_{54} MEK#P:Pase2 0
x_{55} ERK 695000
x_{56} ERK:MEK#P#P 0
x_{57} ERK#P 0
x_{58} ERK#P:MEK#P#P 0
x_{59} ERK#P#P 0
x_{60} PP2A(III) 16870.2
x_{61} ERK#P#P:Pase3 0
x_{62} ERK#P:Pase3 0
x_{63} 2(EGF:ErbB1)#P:GAP:Shc 0
x_{64} 2(EGF:ErbB1)#P:GAP:(Shc#P) 0
x_{65} 2(EGF:ErbB1)#P:GAP:(Shc#P):Grb2 0
x_{66} 2(EGF:ErbB1)#P:GAP:(Shc#P):Grb2:Sos 0
x_{67} 2(EGF:ErbB1)#P:GAP:(Shc#P):Grb2:Sos:(Ras:GDP) 0
x_{68} 2(EGF:ErbB1)#P:GAP:(Shc#P):Grb2:Sos:(Ras:GTP) 0
x_{69} (Ras:GTP)_i 0
x_{70} (Raf:Ras:GTP)_i 0
x_{71} (Ras_activated:GTP)_i 0
x_{72} (Raf#P)_i 0
x_{73} (Raf#P:Pase1)_i 0
x_{74} (MEK:Raf#P)_i 0
x_{75} (MEK#P)_i 0
x_{76} (MEK#P:Raf#P)_i 0
x_{77} (MEK#P#P)_i 0
x_{78} (MEK#P#P:Pase2)_i 0
x_{79} (MEK#P:Pase2)_i 0
x_{80} MEK#P#P:ERK 0
x_{81} (ERK#P)_i 0
x_{82} MEK#P#P:ERK#P 0
x_{83} (ERK#P#P)_i 0
x_{84} (ERK#P#P:Pase3)_i 0
x_{85} (ERK#P:Pase3)_i 0
x_{86} R_degraded 0
x_{87} ErbB2#P 0
x_{88} 2(EGF:ErbB1)#P:GAP:Grb2:Sos:cPP 0
x_{89} 2(EGF:ErbB1)#P:GAP:Grb2:Sos:(Ras:GDP):cPP 0

x_{90} 2(EGF:ErbB1)#P:GAP:Grb2:Sos:(Ras:GTP):cPP 0
x_{91} 2(EGF:ErbB1)#P:GAP:(Shc#P):Grb2:cPP 0
x_{92} 2(EGF:ErbB1)#P:GAP:(Shc#P):Grb2:Sos:cPP 0
x_{93} 2(EGF:ErbB1)#P:GAP:(Shc#P):Grb2:Sos:(Ras:GDP):cPP 0
x_{94} 2(EGF:ErbB1)#P:GAP:(Shc#P):Grb2:Sos:(Ras:GTP):cPP 0
x_{95} 2(EGF:ErbB1)#P:GAP:Grb2:Sos:(ERK#P#P) 0
x_{96} 2(EGF:ErbB1)#P:GAP:Grb2:Sos:(ERK#P#P) 0
x_{97} 2(EGF:ErbB1)#P:GAP:(Shc#P):Grb2:Sos:ERK#P#P 0
x_{98} 2(EGF:ErbB1)#P:GAP:(Shc#P):Grb2:Sos:(ERK#P#P) 0
x_{99} 2(EGF:ErbB1)#P:GAP:Grb2:Sos#P 0
x_{100} 2(EGF:ErbB1)#P:GAP:Grb2:(Sos#P) 0
x_{101} (ERK#P#P):Sos 0
x_{102} ((ERK#P#P):Sos)_i 0
x_{103} Sos#P 0
x_{104} 2(EGF:ErbB1)#P:GAP:Grb2:Gab1#P:PI3K 0
x_{105} ATP 1.2e9
x_{106} PIP3 0
x_{107} AKT 905000
x_{108} PIP3:AKT 0
x_{109} PDK1 3.00416e+08
x_{110} PIP3:AKT:PDK1 0
x_{111} PIP3:PDK1 0
x_{112} AKT#P 0
x_{113} PP2A(IV) 450000
x_{114} AKT#P:Pase4 0
x_{115} (EGF:ErbB1:ATP::EGF:ErbB1:Inh)-HalfActive 0
x_{116} 2(EGF:ErbB1:ATP)-FullActive 0
x_{117} ErbB2:ErbB4 0
x_{121} (EGF:ErbB1:ATP::EGF:ErbB1_h:Inh)-HalfActive 0
x_{122} EGF:ErbB1:ErbB2:ATP 0
x_{123} (EGF:ErbB1:ErbB2):ATP 0
x_{124} (EGF:ErbB1:ErbB3):ATP 0
x_{125} (EGF:ErbB1:ErbB4):ATP 0
x_{126} 2(EGF:ErbB1):ATP 0
x_{127} EGF:ErbB1:ErbB3:ATP 0
x_{128} EGF:ErbB1:ErbB4:ATP 0
x_{129} ErbB2:ErbB2#P:ATP 0
x_{130} (ErbB1:ErbB2)#P:GAP:Grb2:Gab1:ATP 0
x_{131} (ErbB1:ErbB3)#P:GAP:Grb2:Gab1:ATP 0
x_{132} (ErbB1:ErbB4)#P:GAP:Grb2:Gab1:ATP 0
x_{133} 2(ErbB2)#P:GAP:Grb2:Gab1:ATP 0
x_{134} (ErbB3:ErbB2)#P:GAP:Grb2:Gab1:ATP 0
x_{135} (ErbB4:ErbB2)#P:GAP:Grb2:Gab1:ATP 0
x_{136} 2(EGF:ErbB1)#P:GAP:Grb2:Gab1:ATP 0
x_{137} (HRG:ErbB3:ErbB1):ATP 0
x_{138} (HRG:ErbB4:ErbB1):ATP 0

x_{139} (HRG:ErbB4):ErbB2:ATP 0
x_{140} ErbB3 6.23e3
x_{141} ErbB2 4.62e5
x_{142} HRG:ErbB3 0
x_{143} ErbB4 7.94e2
x_{144} HRG:ErbB4 0
x_{145} EGF:ErbB1:ErbB2 0
x_{146} EGF:ErbB1:ErbB3 0
x_{147} EGF:ErbB1:ErbB4 0
x_{148} (ErbB1:ErbB2)#P 0
x_{149} (ErbB1:ErbB3)#P 0
x_{150} (ErbB1:ErbB4)#P 0
x_{151} (ErbB1:ErbB2)#P:GAP 0
x_{152} (ErbB1:ErbB3)#P:GAP 0
x_{153} (ErbB1:ErbB4)#P:GAP 0
x_{154} ErbB3 0
x_{155} ErbB2 0
x_{156} ErbB4 0
x_{157} (HRG:ErbB3) 0
x_{158} (HRG:ErbB4) 0
x_{159} (EGF:ErbB1:ErbB2) 0
x_{160} (EGF:ErbB1:ErbB3) 0
x_{161} (EGF:ErbB1:ErbB4) 0
x_{162} (ErbB1:ErbB2)#P 0
x_{163} (ErbB1:ErbB3)#P 0
x_{164} (ErbB1:ErbB4)#P 0
x_{165} (ErbB1:ErbB2)#P:GAP 0
x_{166} (ErbB1:ErbB3)#P:GAP 0
x_{167} (ErbB1:ErbB4)#P:GAP 0
x_{168} (HRG:ErbB3):ErbB2:ATP 0
x_{169} (HRG:ErbB3):ErbB2):ATP 0
x_{170} (HRG:ErbB4):ErbB2):ATP 0
x_{171} (ErbB1:ErbB2)#P:GAP:Shc 0
x_{172} (ErbB1:ErbB3)#P:GAP:Shc 0
x_{173} (ErbB1:ErbB4)#P:GAP:Shc 0
x_{174} (ErbB1:ErbB2)#P:GAP:Shc 0
x_{175} (ErbB1:ErbB3)#P:GAP:Shc 0
x_{176} (ErbB1:ErbB4)#P:GAP:Shc 0
x_{180} (ErbB1:ErbB2)#P:GAP:(Shc#P) 0
x_{181} (ErbB1:ErbB3)#P:GAP:(Shc#P) 0
x_{182} (ErbB1:ErbB4)#P:GAP:(Shc#P) 0
x_{183} (ErbB1:ErbB2)#P:GAP:(Shc#P) 0
x_{184} (ErbB1:ErbB3)#P:GAP:(Shc#P) 0
x_{185} (ErbB1:ErbB4)#P:GAP:(Shc#P) 0
x_{189} (ErbB1:ErbB2)#P:GAP:(Shc#P):Grb2 0
x_{190} (ErbB1:ErbB3)#P:GAP:(Shc#P):Grb2 0

x_{191} (ErbB1:ErbB4)#P:GAP:(Shc#P):Grb2 0
x_{192} (ErbB1:ErbB2)#P:GAP:(Shc#P):Grb2 0
x_{193} (ErbB1:ErbB3)#P:GAP:(Shc#P):Grb2 0
x_{194} (ErbB1:ErbB4)#P:GAP:(Shc#P):Grb2 0
x_{195} (ErbB1:ErbB2)#P:GAP:(Shc#P):Grb2:cPP 0
x_{196} (ErbB1:ErbB3)#P:GAP:(Shc#P):Grb2:cPP 0
x_{197} (ErbB1:ErbB4)#P:GAP:(Shc#P):Grb2:cPP 0
x_{198} (ErbB1:ErbB2)#P:GAP:(Shc#P):Grb2:Sos 0
x_{199} (ErbB1:ErbB3)#P:GAP:(Shc#P):Grb2:Sos 0
x_{200} (ErbB1:ErbB4)#P:GAP:(Shc#P):Grb2:Sos 0
x_{201} (ErbB1:ErbB2)#P:GAP:(Shc#P):Grb2:Sos 0
x_{202} (ErbB1:ErbB3)#P:GAP:(Shc#P):Grb2:Sos 0
x_{203} (ErbB1:ErbB4)#P:GAP:(Shc#P):Grb2:Sos 0
x_{204} (ErbB1:ErbB2)#P:GAP:(Shc#P):Grb2:Sos:cPP 0
x_{205} (ErbB1:ErbB3)#P:GAP:(Shc#P):Grb2:Sos:cPP 0
x_{206} (ErbB1:ErbB4)#P:GAP:(Shc#P):Grb2:Sos:cPP 0
x_{207} (ErbB1:ErbB2)#P:GAP:(Shc#P):Grb2:Sos:(Ras:GDP) 0
x_{208} (ErbB1:ErbB3)#P:GAP:(Shc#P):Grb2:Sos:(Ras:GDP) 0
x_{209} (ErbB1:ErbB4)#P:GAP:(Shc#P):Grb2:Sos:(Ras:GDP) 0
x_{210} (ErbB1:ErbB2)#P:GAP:(Shc#P):Grb2:Sos:(Ras:GDP) 0
x_{211} (ErbB1:ErbB3)#P:GAP:(Shc#P):Grb2:Sos:(Ras:GDP) 0
x_{212} (ErbB1:ErbB4)#P:GAP:(Shc#P):Grb2:Sos:(Ras:GDP) 0
x_{213} (ErbB1:ErbB2)#P:GAP:(Shc#P):Grb2:Sos:(Ras:GDP):cPP 0
x_{214} (ErbB1:ErbB3)#P:GAP:(Shc#P):Grb2:Sos:(Ras:GDP):cPP 0
x_{215} (ErbB1:ErbB4)#P:GAP:(Shc#P):Grb2:Sos:(Ras:GDP):cPP 0
x_{216} (ErbB1:ErbB2)#P:GAP:(Shc#P):Grb2:Sos:(Ras:GTP) 0
x_{217} (ErbB1:ErbB3)#P:GAP:(Shc#P):Grb2:Sos:(Ras:GTP) 0
x_{218} (ErbB1:ErbB4)#P:GAP:(Shc#P):Grb2:Sos:(Ras:GTP) 0
x_{219} (ErbB1:ErbB2)#P:GAP:(Shc#P):Grb2:Sos:(Ras:GTP) 0
x_{220} (ErbB1:ErbB3)#P:GAP:(Shc#P):Grb2:Sos:(Ras:GTP) 0
x_{221} (ErbB1:ErbB4)#P:GAP:(Shc#P):Grb2:Sos:(Ras:GTP) 0
x_{222} (ErbB1:ErbB2)#P:GAP:(Shc#P):Grb2:Sos:(Ras:GTP):cPP 0
x_{223} (ErbB1:ErbB3)#P:GAP:(Shc#P):Grb2:Sos:(Ras:GTP):cPP 0
x_{224} (ErbB1:ErbB4)#P:GAP:(Shc#P):Grb2:Sos:(Ras:GTP):cPP 0
x_{225} (ErbB1:ErbB2)#P:GAP:Grb2 0
x_{226} (ErbB1:ErbB3)#P:GAP:Grb2 0
x_{227} (ErbB1:ErbB4)#P:GAP:Grb2 0
x_{228} (ErbB1:ErbB2)#P:GAP:Grb2 0
x_{229} (ErbB1:ErbB3)#P:GAP:Grb2 0
x_{230} (ErbB1:ErbB4)#P:GAP:Grb2 0
x_{231} (ErbB1:ErbB2)#P:GAP:Grb2:cPP 0
x_{232} (ErbB1:ErbB3)#P:GAP:Grb2:cPP 0
x_{233} (ErbB1:ErbB4)#P:GAP:Grb2:cPP 0
x_{234} (ErbB1:ErbB2)#P:GAP:Grb2:Sos 0
x_{235} (ErbB1:ErbB3)#P:GAP:Grb2:Sos 0
x_{236} (ErbB1:ErbB4)#P:GAP:Grb2:Sos 0

x_{237} (ErbB1:ErbB2)#P:GAP:Grb2:Sos 0
x_{238} (ErbB1:ErbB3)#P:GAP:Grb2:Sos 0
x_{239} (ErbB1:ErbB4)#P:GAP:Grb2:Sos 0
x_{240} (ErbB1:ErbB2)#P:GAP:Grb2:Sos:cPP 0
x_{241} (ErbB1:ErbB3)#P:GAP:Grb2:Sos:cPP 0
x_{242} (ErbB1:ErbB4)#P:GAP:Grb2:Sos:cPP 0
x_{243} (ErbB1:ErbB2)#P:GAP:Grb2:Sos:(Ras:GDP) 0
x_{244} (ErbB1:ErbB3)#P:GAP:Grb2:Sos:(Ras:GDP) 0
x_{245} (ErbB1:ErbB4)#P:GAP:Grb2:Sos:(Ras:GDP) 0
x_{246} (ErbB1:ErbB2)#P:GAP:Grb2:Sos:(Ras:GDP) 0
x_{247} (ErbB1:ErbB3)#P:GAP:Grb2:Sos:(Ras:GDP) 0
x_{248} (ErbB1:ErbB4)#P:GAP:Grb2:Sos:(Ras:GDP) 0
x_{249} (ErbB1:ErbB2)#P:GAP:Grb2:Sos:(Ras:GDP):cPP 0
x_{250} (ErbB1:ErbB3)#P:GAP:Grb2:Sos:(Ras:GDP):cPP 0
x_{251} (ErbB1:ErbB4)#P:GAP:Grb2:Sos:(Ras:GDP):cPP 0
x_{252} (ErbB1:ErbB2)#P:GAP:Grb2:Sos:(Ras:GTP) 0
x_{253} (ErbB1:ErbB3)#P:GAP:Grb2:Sos:(Ras:GTP) 0
x_{254} (ErbB1:ErbB4)#P:GAP:Grb2:Sos:(Ras:GTP) 0
x_{255} (ErbB1:ErbB2)#P:GAP:Grb2:Sos:(Ras:GTP) 0
x_{256} (ErbB1:ErbB3)#P:GAP:Grb2:Sos:(Ras:GTP) 0
x_{257} (ErbB1:ErbB4)#P:GAP:Grb2:Sos:(Ras:GTP) 0
x_{258} (ErbB1:ErbB2)#P:GAP:Grb2:Sos:(Ras:GTP):cPP 0
x_{259} (ErbB1:ErbB3)#P:GAP:Grb2:Sos:(Ras:GTP):cPP 0
x_{260} (ErbB1:ErbB4)#P:GAP:Grb2:Sos:(Ras:GTP):cPP 0
x_{261} (ErbB1:ErbB2)#P:GAP:Grb2:Gab1#P:PI3K 0
x_{262} (ErbB1:ErbB3)#P:GAP:Grb2:Gab1#P:PI3K 0
x_{263} (ErbB1:ErbB4)#P:GAP:Grb2:Gab1#P:PI3K 0
x_{264} 2(EGF:ErbB1)#P:GAP:Grb2:(Gab1#P):PI3K:Ras:GDP 0
x_{265} (ErbB1:ErbB2)#P:GAP:Grb2:Gab1#P:PI3K:Ras:GDP 0
x_{266} (ErbB1:ErbB3)#P:GAP:Grb2:Gab1#P:PI3K:Ras:GDP 0
x_{267} (ErbB1:ErbB4)#P:GAP:Grb2:Gab1#P:PI3K:Ras:GDP 0
x_{268} 2(ErbB2)#P:GAP:Grb2:Gab1#P:PI3K:Ras:GDP 0
x_{269} (ErbB3:ErbB2)#P:GAP:Grb2:Gab1#P:PI3K:Ras:GDP 0
x_{279} PTEN 56100.9
x_{280} RTK_Pase 70000
x_{281} (ErbB1:ErbB3)#P:RTK_Pase 0
x_{282} (ErbB1:ErbB4)#P:RTK_Pase 0
x_{283} 2(ErbB2)#P:RTK_Pase 0
x_{284} ErbB2:ErbB2#P 0
x_{285} Inh 0
x_{286} ErbB1:Inh 0
x_{287} PI3K 3.55656e+07
x_{288} (ErbB2:ErbB3) 0
x_{289} 2(ErbB2)#P 0
x_{290} 2(ErbB2)#P 0
x_{291} 2(ErbB2)#P:GAP 0

x_{293} 2(ErbB2)#P:GAP 0
x_{294} 2(ErbB2)#P:GAP:Shc 0
x_{296} 2(ErbB2)#P:GAP:Shc 0
x_{297} 2(ErbB2)#P:GAP:(Shc#P) 0
x_{299} 2(ErbB2)#P:GAP:(Shc#P) 0
x_{300} 2(ErbB2)#P:GAP:(Shc#P):Grb2 0
x_{301} 2(ErbB2)#P:GAP:(Shc#P):Grb2:cPP 0
x_{302} 2(ErbB2)#P:GAP:(Shc#P):Grb2 0
x_{303} 2(ErbB2)#P:GAP:(Shc#P):Grb2:Sos 0
x_{304} 2(ErbB2)#P:GAP:(Shc#P):Grb2:Sos:cPP 0
x_{305} 2(ErbB2)#P:GAP:(Shc#P):Grb2:Sos 0
x_{306} 2(ErbB2)#P:GAP:(Shc#P):Grb2:Sos:(Ras:GDP) 0
x_{307} 2(ErbB2)#P:GAP:(Shc#P):Grb2:Sos:(Ras:GDP):cPP 0
x_{308} 2(ErbB2)#P:GAP:(Shc#P):Grb2:Sos:(Ras:GDP) 0
x_{309} 2(ErbB2)#P:GAP:(Shc#P):Grb2:Sos:(Ras:GTP) 0
x_{310} 2(ErbB2)#P:GAP:(Shc#P):Grb2:Sos:(Ras:GTP):cPP 0
x_{311} 2(ErbB2)#P:GAP:(Shc#P):Grb2:Sos:(Ras:GTP) 0
x_{312} 2(ErbB2)#P:GAP:Grb2 0
x_{313} 2(ErbB2)#P:GAP:Grb2:cPP 0
x_{314} 2(ErbB2)#P:GAP:Grb2 0
x_{315} 2(ErbB2)#P:GAP:Grb2:Sos 0
x_{316} 2(ErbB2)#P:GAP:Grb2:Sos:cPP 0
x_{317} 2(ErbB2)#P:GAP:Grb2:Sos 0
x_{318} 2(ErbB2)#P:GAP:Grb2:Sos:(Ras:GDP) 0
x_{319} 2(ErbB2)#P:GAP:Grb2:Sos:(Ras:GDP):cPP 0
x_{320} 2(ErbB2)#P:GAP:Grb2:Sos:(Ras:GDP) 0
x_{321} 2(ErbB2)#P:GAP:Grb2:Sos:(Ras:GTP) 0
x_{322} 2(ErbB2)#P:GAP:Grb2:Sos:(Ras:GTP):cPP 0
x_{323} 2(ErbB2)#P:GAP:Grb2:Sos:(Ras:GTP) 0
x_{324} 2(ErbB2)#P:GAP:Grb2:Gab1#P:PI3K 0
x_{325} (ErbB4:ErbB2)#P:GAP:Grb2:Gab1#P:PI3K:Ras:GDP 0
x_{330} EGF:ErbB1#P 0
x_{331} ErbB3#P 0
x_{332} ErbB4#P 0
x_{335} (ErbB3:ErbB2)#P 0
x_{336} (ErbB4:ErbB2)#P 0
x_{337} (ErbB3:ErbB2)#P 0
x_{338} (ErbB4:ErbB2)#P 0
x_{339} (ErbB3:ErbB2) 0
x_{340} (ErbB4:ErbB2) 0
x_{341} (ErbB3:ErbB2)#P:GAP 0
x_{343} (ErbB3:ErbB2)#P:GAP 0
x_{344} (ErbB4:ErbB2)#P:GAP 0
x_{345} (HRG:ErbB4):ErbB2 0
x_{346} (ErbB4:ErbB2)#P:GAP 0
x_{347} (ErbB3:ErbB2)#P:GAP:Shc 0

x_{348} (ErbB4:ErbB2)#P:GAP:Shc 0
x_{349} (ErbB3:ErbB2)#P:GAP:Shc 0
x_{350} (ErbB4:ErbB2)#P:GAP:Shc 0
x_{351} (ErbB3:ErbB2)#P:GAP:(Shc#P) 0
x_{353} (ErbB3:ErbB2)#P:GAP:(Shc#P) 0
x_{354} (ErbB4:ErbB2)#P:GAP:(Shc#P) 0
x_{355} (HRG:ErbB3):ErbB2 0
x_{356} (ErbB4:ErbB2)#P:GAP:(Shc#P) 0
x_{357} (ErbB3:ErbB2)#P:GAP:(Shc#P):Grb2 0
x_{358} (ErbB3:ErbB2)#P:GAP:(Shc#P):Grb2:cPP 0
x_{359} (ErbB3:ErbB2)#P:GAP:(Shc#P):Grb2 0
x_{360} (ErbB4:ErbB2)#P:GAP:(Shc#P):Grb2 0
x_{361} (ErbB4:ErbB2)#P:GAP:(Shc#P):Grb2:cPP 0
x_{362} (ErbB4:ErbB2)#P:GAP:(Shc#P):Grb2 0
x_{363} (ErbB3:ErbB2)#P:GAP:(Shc#P):Grb2:Sos 0
x_{364} (ErbB3:ErbB2)#P:GAP:(Shc#P):Grb2:Sos:cPP 0
x_{365} (ErbB3:ErbB2)#P:GAP:(Shc#P):Grb2:Sos 0
x_{366} (ErbB4:ErbB2)#P:GAP:(Shc#P):Grb2:Sos 0
x_{367} (ErbB4:ErbB2)#P:GAP:(Shc#P):Grb2:Sos:cPP 0
x_{368} (ErbB4:ErbB2)#P:GAP:(Shc#P):Grb2:Sos 0
x_{369} (ErbB3:ErbB2)#P:GAP:(Shc#P):Grb2:Sos:(Ras:GDP) 0
x_{370} (ErbB3:ErbB2)#P:GAP:(Shc#P):Grb2:Sos:(Ras:GDP):cPP 0
x_{371} (ErbB3:ErbB2)#P:GAP:(Shc#P):Grb2:Sos:(Ras:GDP) 0
x_{372} (ErbB4:ErbB2)#P:GAP:(Shc#P):Grb2:Sos:(Ras:GDP) 0
x_{373} (ErbB4:ErbB2)#P:GAP:(Shc#P):Grb2:Sos:(Ras:GDP):cPP 0
x_{374} (ErbB4:ErbB2)#P:GAP:(Shc#P):Grb2:Sos:(Ras:GDP) 0
x_{375} (ErbB3:ErbB2)#P:GAP:(Shc#P):Grb2:Sos:(Ras:GTP) 0
x_{376} (ErbB3:ErbB2)#P:GAP:(Shc#P):Grb2:Sos:(Ras:GTP):cPP 0
x_{377} (ErbB3:ErbB2)#P:GAP:(Shc#P):Grb2:Sos:(Ras:GTP) 0
x_{378} (ErbB4:ErbB2)#P:GAP:(Shc#P):Grb2:Sos:(Ras:GTP) 0
x_{379} (ErbB4:ErbB2)#P:GAP:(Shc#P):Grb2:Sos:(Ras:GTP):cPP 0
x_{380} (ErbB4:ErbB2)#P:GAP:(Shc#P):Grb2:Sos:(Ras:GTP) 0
x_{381} (ErbB3:ErbB2)#P:GAP:Grb2 0
x_{382} (ErbB3:ErbB2)#P:GAP:Grb2:cPP 0
x_{383} (ErbB3:ErbB2)#P:GAP:Grb2 0
x_{384} (ErbB4:ErbB2)#P:GAP:Grb2 0
x_{385} (ErbB4:ErbB2)#P:GAP:Grb2:cPP 0
x_{386} (ErbB4:ErbB2)#P:GAP:Grb2 0
x_{387} (ErbB3:ErbB2)#P:GAP:Grb2:Sos 0
x_{388} (ErbB3:ErbB2)#P:GAP:Grb2:Sos:cPP 0
x_{389} (ErbB3:ErbB2)#P:GAP:Grb2:Sos 0
x_{390} (ErbB4:ErbB2)#P:GAP:Grb2:Sos 0
x_{391} (ErbB4:ErbB2)#P:GAP:Grb2:Sos:cPP 0
x_{392} (ErbB4:ErbB2)#P:GAP:Grb2:Sos 0
x_{393} (ErbB3:ErbB2)#P:GAP:Grb2:Sos:(Ras:GDP) 0
x_{394} (ErbB3:ErbB2)#P:GAP:Grb2:Sos:(Ras:GDP):cPP 0

x_{395} (ErbB3:ErbB2)#P:GAP:Grb2:Sos:(Ras:GDP) 0
x_{396} (ErbB4:ErbB2)#P:GAP:Grb2:Sos:(Ras:GDP) 0
x_{397} (ErbB4:ErbB2)#P:GAP:Grb2:Sos:(Ras:GDP):cPP 0
x_{398} (ErbB4:ErbB2)#P:GAP:Grb2:Sos:(Ras:GDP) 0
x_{399} (ErbB3:ErbB2)#P:GAP:Grb2:Sos:(Ras:GTP) 0
x_{400} (ErbB3:ErbB2)#P:GAP:Grb2:Sos:(Ras:GTP):cPP 0
x_{401} (ErbB3:ErbB2)#P:GAP:Grb2:Sos:(Ras:GTP) 0
x_{402} (ErbB4:ErbB2)#P:GAP:Grb2:Sos:(Ras:GTP) 0
x_{403} (ErbB4:ErbB2)#P:GAP:Grb2:Sos:(Ras:GTP):cPP 0
x_{404} (ErbB4:ErbB2)#P:GAP:Grb2:Sos:(Ras:GTP) 0
x_{405} (ErbB3:ErbB2)#P:GAP:Grb2:Gab1#P:PI3K 0
x_{407} (ErbB4:ErbB2)#P:GAP:Grb2:Gab1:#P#P:Pase9t 0
x_{408} (ErbB4:ErbB2)#P:GAP:Grb2:Gab1#P:PI3K 0
x_{409} (ErbB1:ErbB3)#P:GAP:Grb2:Gab1##P 0
x_{410} (ErbB1:ErbB4)#P:GAP:Grb2:Gab1##P 0
x_{411} (ErbB1:ErbB3)#P:GAP:Grb2:Gab1##P:Pase9t 0
x_{412} (ErbB1:ErbB4)#P:GAP:Grb2:Gab1##P:Pase9t 0
x_{415} 2(EGF:ErbB1)#P:RTK_Pase 0
x_{416} (ErbB1:ErbB2)#P:RTK_Pase 0
x_{417} (ErbB2:ErbB3)#P:RTK_Pase 0
x_{418} (ErbB2:ErbB4)#P:RTK_Pase 0
x_{419} 2(EGF:ErbB1)#P:GAP:(Shc#P):Grb2:(Sos#P) 0
x_{420} 2(EGF:ErbB1)#P:GAP:(Shc#P):Grb2:(Sos#P) 0
x_{421} (HRG:ErbB3):ErbB2) 0
x_{422} (HRG:ErbB4):ErbB2) 0
x_{424} ErbB1:ErbB:Gab1#P##:Pase9t 0
x_{425} 2(ErbB2) 0
x_{426} Gab1 94868.3
x_{427} (ErbB1:ErbB2)#P:GAP:Grb2:Gab1 0
x_{428} (ErbB1:ErbB3)#P:GAP:Grb2:Gab1 0
x_{429} (ErbB1:ErbB4)#P:GAP:Grb2:Gab1 0
x_{430} ErbB1:ErbB:Gab1#P## 0
x_{431} 2(EGF:ErbB1)#P:GAP:Grb2:(Gab1#P):ERK#P#P 0
x_{432} 2(EGF:ErbB1)#P:GAP:Grb2:(Gab1#P):ERK#P#P_i 0
x_{433} (ErbB1:ErbB2)#P:GAP:Grb2:Gab1#P:ERK#P#P 0
x_{434} (ErbB1:ErbB2)#P:GAP:Grb2:Gab1#P:ERK#P#P_i 0
x_{435} (ErbB1:ErbB3)#P:GAP:Grb2:Gab1#P:ERK#P#P 0
x_{436} 2(ErbB2)#P:GAP:Grb2:Gab1 0
x_{437} (ErbB1:ErbB3)#P:GAP:Grb2:Gab1#P:ERK#P#P_i 0
x_{438} (ErbB1:ErbB4)#P:GAP:Grb2:Gab1#P_ERK#P#P 0
x_{439} (ErbB3:ErbB2)#P:GAP:Grb2:Gab1 0
x_{440} (ErbB1:ErbB4)#P:GAP:Grb2:Gab1#P:ERK#P#P_i 0
x_{442} (ErbB4:ErbB2)#P:GAP:Grb2:Gab1 0
x_{444} PIP2 393639
x_{445} (ErbB1:ErbB2)#P:GAP:Grb2:Gab1#P 0
x_{446} (ErbB1:ErbB3)#P:GAP:Grb2:Gab1#P 0

x_{447} (ErbB1:ErbB4)#P:GAP:Grb2:Gab1#P 0
x_{448} 2(EGF:ErbB1)#P:GAP:Grb2:Gab1#P:PI3K:PIP2 0
x_{449} (ErbB1:ErbB2)#P:GAP:Grb2:Gab1#P:PI3K:PIP2 0
x_{450} (ErbB1:ErbB3)#P:GAP:Grb2:Gab1#P:PI3K:PIP2 0
x_{451} (ErbB1:ErbB4)#P:GAP:Grb2:Gab1#P:PI3K:PIP2 0
x_{452} 2(ErbB2)#P:GAP:Grb2:Gab1#P:PI3K:PIP2 0
x_{453} (ErbB3:ErbB2)#P:GAP:Grb2:Gab1#P:PI3K:PIP2 0
x_{454} 2(ErbB2)#P:GAP:Grb2:Gab1#P 0
x_{455} PI3K 0
x_{456} ErbB3/4:ErbB2:Gab1#P##:Pase9t 0
x_{457} (ErbB3:ErbB2)#P:GAP:Grb2:Gab1#P 0
x_{460} (ErbB4:ErbB2)#P:GAP:Grb2:Gab1#P 0
x_{461} Shp 2213.59
x_{462} PIP3:Shp 0
x_{463} Shp2 1e+06
x_{464} (ErbB1:ErbB2)#P:GAP:Grb2:Gab1#P:Shp2 0
x_{465} (ErbB1:ErbB3)#P:GAP:Grb2:Gab1#P:Shp2 0
x_{466} (ErbB1:ErbB4)#P:GAP:Grb2:Gab1#P:Shp2 0
x_{467} (ErbB3:ErbB2)#P:GAP:Grb2:Gab1#P:PI3K:(PIP2)2 0
x_{468} (ErbB3:ErbB2)#P:GAP:Grb2:Gab1#P:PI3K:(PIP2)3 0
x_{469} (ErbB3:ErbB2)#P:GAP:Grb2:Gab1#P:PI3K:(PIP2)4 0
x_{470} (ErbB3:ErbB2)#P:GAP:Grb2:Gab1#P:PI3K:(PIP2)5 0
x_{471} (ErbB3:ErbB2)#P:GAP:Grb2:Gab1#P:PI3K:(PIP2)6 0
x_{472} AKT:P:P:Raf:P:Ser 0
x_{473} 2(ErbB2)#P:GAP:Grb2:Gab1#P:Shp2 0
x_{474} 2(ErbB2)#P:GAP:Grb2:Gab1#P:ERK#P#P 0
x_{475} 2(ErbB2)#P:GAP:Grb2:Gab1#P:ERK#P#P_i 0
x_{476} (ErbB3:ErbB2)#P:GAP:Grb2:Gab1#P:Shp2 0
x_{477} (ErbB3:ErbB2)#P:GAP:Grb2:Gab1#P:ERK#P#P 0
x_{478} (ErbB3:ErbB2)#P:GAP:Grb2:Gab1#P:ERK#P#P_i 0
x_{479} (ErbB4:ErbB2)#P:GAP:Grb2:Gab1#P:Shp2 0
x_{480} (ErbB4:ErbB2)#P:GAP:Grb2:Gab1#P:ERK#P#P 0
x_{481} (ErbB4:ErbB2)#P:GAP:Grb2:Gab1#P:ERK#P#P_i 0
x_{482} PIP3:PTEN 0
x_{483} 2(EGF:ErbB1)#P:GAP:Grb2:Gab1 0
x_{484} AKT:P:P:Raf:P:Ser_i 0
x_{485} Raf:P:Ser 0
x_{486} 2(EGF:ErbB1)#P:GAP:Grb2:(Gab1#P##) 0
x_{487} (ErbB4:ErbB2)#P:GAP:Grb2:Gab1:#P#P 0
x_{488} 2(EGF:ErbB1):Gab1#P## 0
x_{489} 2(EGF:ErbB1)#P:GAP:Grb2:(Gab1#P):Shp2 0
x_{490} 2(ErbB2)2:Gab1#P## 0
x_{491} ErbB3/4:ErbB2:Gab1#P## 0
x_{492} EGF:ErbB1:Inh:ErB2 0
x_{493} EGF:ErbB1:Inh:ErB3 0
x_{494} EGF:ErbB1:Inh:ErB4 0

x_{495} PIP3:AKT#P 0
x_{496} PIP3:AKT#P:PDK1 0
x_{497} AKT:P:P 0
x_{498} AKT:P:P:Pase4 0
x_{499} EGF:ErbB1:Inh 0
x_{500} (EGF:ErbB1:ATP::EGF:ErbB1:Inh):Inh 0
x_{501} 2(EGF:ErbB1:Inh) 0
x_{502} ErbB2:Inh 0
x_{503} ErbB4:Inh 0
x_{504} (EGF:ErbB1:ErbB2):Inh 0
x_{505} (EGF:ErbB1:ErbB3)#P:Inh 0
x_{506} ErbB3:Inh 0
x_{507} (EGF:ErbB1:ErbB3)#P:Inh 0
x_{508} ErbB2:Inh 0
x_{509} ErbB2:ErbB2:Inh 0
x_{510} ErbB3:ErbB2:Inh 0
x_{511} ErbB4:ErbB2:Inh 0
x_{512} ErbB4:Inh 0
x_{513} ErbB4:Inh:ErbB2 0
x_{514} HRG 0
x_{515} HRG 0
x_{516} (HRG:ErbB3:ErbB1) 0
x_{517} (HRG:ErbB4:ErbB1) 0
x_{518} (HRG:ErbB3:ErbB1) 0
x_{519} (HRG:ErbB4:ErbB1) 0
x_{520} MKP_deg 0
x_{521} Pase9t 0
x_{522} 2(EGF:ErbB1):Gab1#P##:Pase9t 0
x_{523} 2(ErbB2)2:Gab1#P##:Pase9t 0
x_{524} ErbB1_h:ATP 0
x_{525} ErbB1_h:Inh 0
x_{526} EGF:ErbB1_h:Inh 0
x_{527} EGF:ErbB1:ATP::EGF:ErbB1_h:Inh 0
x_{528} 2(EGF:ErbB1_h:Inh) 0
x_{529} EGF:ErbB1_h:ATP 0
x_{530} ErbB1_h:ATP 0
x_{531} ErbB1 1.08e6
x_{532} ErbB1_h 0
x_{550} (EGF:ErbB1:ATP::EGF:ErbB1_h:ATP) 0
x_{551} (EGF:ErbB1:Inh::EGF:ErbB1_h:ATP) 0
x_{552} 2(EGF:ErbB1_h:ATP) 0
x_{553} (EGF:ErbB1:ATP::EGF:ErbB1_h:Inh) 0
x_{554} (EGF:ErbB1:Inh::EGF:ErbB1_h:Inh) 0
x_{555} (EGF:ErbB1:ATP::EGF:ErbB1_h:ATP)-FullActive 0
x_{556} (EGF:ErbB1:Inh::EGF:ErbB1_h:ATP)-HalfActive 0
x_{557} 2(EGF:ErbB1_h:ATP)-FullActive 0

x_{558} (EGF:ErbB1:ATP::EGF:ErbB1_h:Inh)-HalfActive 0

C

Rates that are 0 participate in regulation reactions that may be turned on/off for testing hypotheses.
k_{1c} 0 /molecule/s *
k_1 1.00e+07 /molecule/s *
k_{1d} 0 /molecule/s *
k_2 7.45e-06 /molecule/s
k_{2b} 3.74e-08 /molecule/s
k_{4b} 0.00e+00 /molecule/s
k_4 6.73e-06 /molecule/s
k_5 0.00e+00 /molecule/s
k_{5b} 0.00e+00 /molecule/s
k_{6b} 0.00e+00 /s
k_6 1.30e-02 /s *
k_7 5.00e-05 /s
k_8 5.91e-07 /molecule/s
k_{8b} 9.35e-06 /molecule/s
k_{10b} 5.43e-02 /molecule/s
k_{15} 1.67e-08 /s
k_{16} 1.67e-05 /molecule/s
k_{17} 1.67e-05 /molecule/s
k_{18} 2.50e-05 /molecule/s
k_{19} 1.67e-07 /molecule/s
k_{20} 1.11e-05 /molecule/s
k_{21} 3.67e-07 /molecule/s
k_{22} 1.39e-07 /molecule/s
k_{23} 6.00e+00 /s
k_{25} 1.67e-05 /molecule/s
k_{28} 5.00e-06 /molecule/s
k_{29} 1.17e-06 /molecule/s
k_{32} 4.00e-07 /molecule/s
k_{33} 3.50e-05 /molecule/s
k_{34} 7.50e-06 /molecule/s
k_{35} 7.50e-06 /molecule/s *
k_{36} 5.00e-03 /s
k_{37} 1.50e-06 /molecule/s
k_{40} 5.00e-05 /molecule/s
k_{41} 5.00e-05 /molecule/s
k_{42} 6.00e-05 /molecule/s
k_{43} 0.00e+00 /molecule/s
k_{44} $(k_{45} + k_{44})/6.00e23/1.00e - 12/3.00e - 07$ /molecule/s
k_{45} 0.00e+00 /molecule/s
k_{47} 0.00e+00 /molecule/s
k_{48} 2.51e-05 /molecule/s *

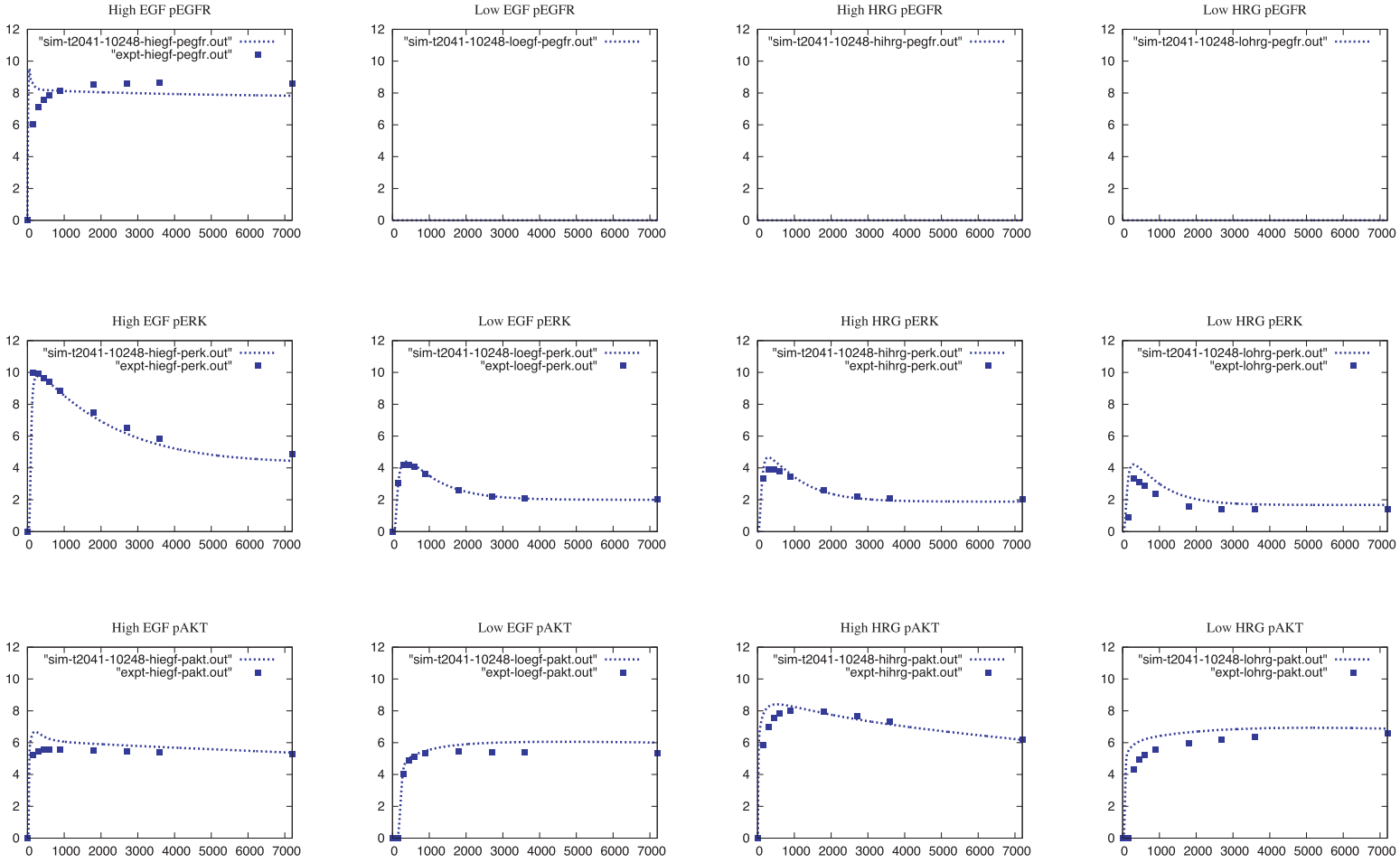
k_{49} 0.00e+00 /molecule/s
k_{50} 2.66e-68 /molecule/s *
k_{52} $(k_{-53} + k_{-52})/6.00e23/1.00e - 12/3.00e - 07$ /molecule/s
k_{53} 0.00e+00 /molecule/s
k_{55} 0.00e+00 /molecule/s
k_{56} 1.46e-5 /molecule/s *
k_{57} 0.00e+00 /molecule/s
k_{58} 3.33e-08 /molecule/s *
k_{60} 2.67e-03 /s
k_{60b} 4.71e-02 /s
k_{60c} 5.20e-04 /s
k_{61} 5.70e-04 /s
k_{62b} 4.16e-04 /s
k_{64} 1.67e-05 /molecule/s
k_{65} 0.00e+00 /molecule/s
k_{66} 1.50e-05 /molecule/s
k_{67} 5.00e-05 /molecule/s
k_{68} 0.00e+00 /molecule/s
k_{69} 3.33e-05 /molecule/s
k_{70} 6.67e-07 /molecule/s
k_{71} 0.00e+00 /molecule/s
k_{72} 0.00e+00 /molecule/s
k_{73} 8.33e-07 /molecule/s *
k_{74} 1.67e-06 /molecule/s *
k_{75} 0.00e+00 /molecule/s
k_{76} 0.00e+00 /molecule/s
k_{94b} 5.00e-05 /molecule/s
k_{94} 5.00e-05 /molecule/s
k_{95} 0.00e+00 /molecule/s
k_{96} 1.67e-06 /molecule/s
k_{97c} 1.00e+06 /molecule/s
k_{97} 1.00e+06 /molecule/s
k_{98} 3.33e+04 /molecule/s
k_{99} 4.42e+00 /molecule/s
k_{100} 1.00e+00 /molecule/s
k_{101} 8.33e-07 /molecule/s
k_{102} 5.00e-07 /molecule/s
k_{103} 1.67e-10 /molecule/s *
k_{104} 0.00e+00 /molecule/s
k_{105} 6.67e-05 /molecule/s
k_{106} 1.33e-05 /molecule/s
k_{106b} 2.63e-08 /molecule/s
k_{107} 3.33e-05 /molecule/s
k_{108} 0.00e+00 /molecule/s
k_{109} 5.00e-06 /molecule/s
k_{110} 3.33e-04 /molecule/s

k_{111} 0.00e+00 /molecule/s
k_{112} 4.71e-03 /molecule/s
k_{113} 0.00e+00 /molecule/s
k_{114} 4.99e-06 /molecule/s
k_{115} 0.00e+00 /molecule/s
k_{116} 1.50e-02 /s
k_{117} 8.33e-08 /molecule/s
k_{118} 0.00e+00 /molecule/s
k_{119} 1.00e+07 /molecule/s *
k_{120b} 5.93e-11 /molecule/s
k_{120} 1.33e-9 /molecule/s *
k_{122} 1.87e-08 /molecule/s *
k_{123} 0.00e+00 /molecule/s
k_{-1} 3.30e-02 /s *
k_{-1d} 0 /s *
k_{-1c} 1.00e+00 /s
k_{-2b} 1.60e-02 /s
k_{-2} 1.60e-01 /s
k_{-4} 1.66e-04 /s
k_{-5} 8.08e-01 /s
k_{-5b} 8.08e-03 /s
k_{-6} 5.00e-05 /s *
k_{-6b} 0.00e+00 /s
k_{-7} 1.38e-04 /s
k_{-8} 2.00e-01 /s
k_{-8b} 2.00e-02 /s
k_{-10} 1.10e-02 /s
k_{-15} 0.00e+00 /s
k_{-17} 6.00e-02 /s
k_{-18} 1.30e+00 /s
k_{-19} 5.00e-01 /s
k_{-20} 4.00e-01 /s
k_{-21} 2.30e-01 /s
k_{-22b} 1.00e-01 /s
k_{-22} 1.00e-01 /s
k_{-23} 6.00e-02 /s
k_{-24} 5.50e-01 /s
k_{-25} 2.14e-02 /s
k_{-28} 5.30e-03 /s
k_{-29} 3.10e+00 /s
k_{-32} 1.00e-01 /s
k_{-33} 2.00e-01 /s
k_{-34} 3.00e-02 /s
k_{-35} 1.50e-03 /s *
k_{-36} 0.00e+00 /s
k_{-37} 3.00e-01 /s

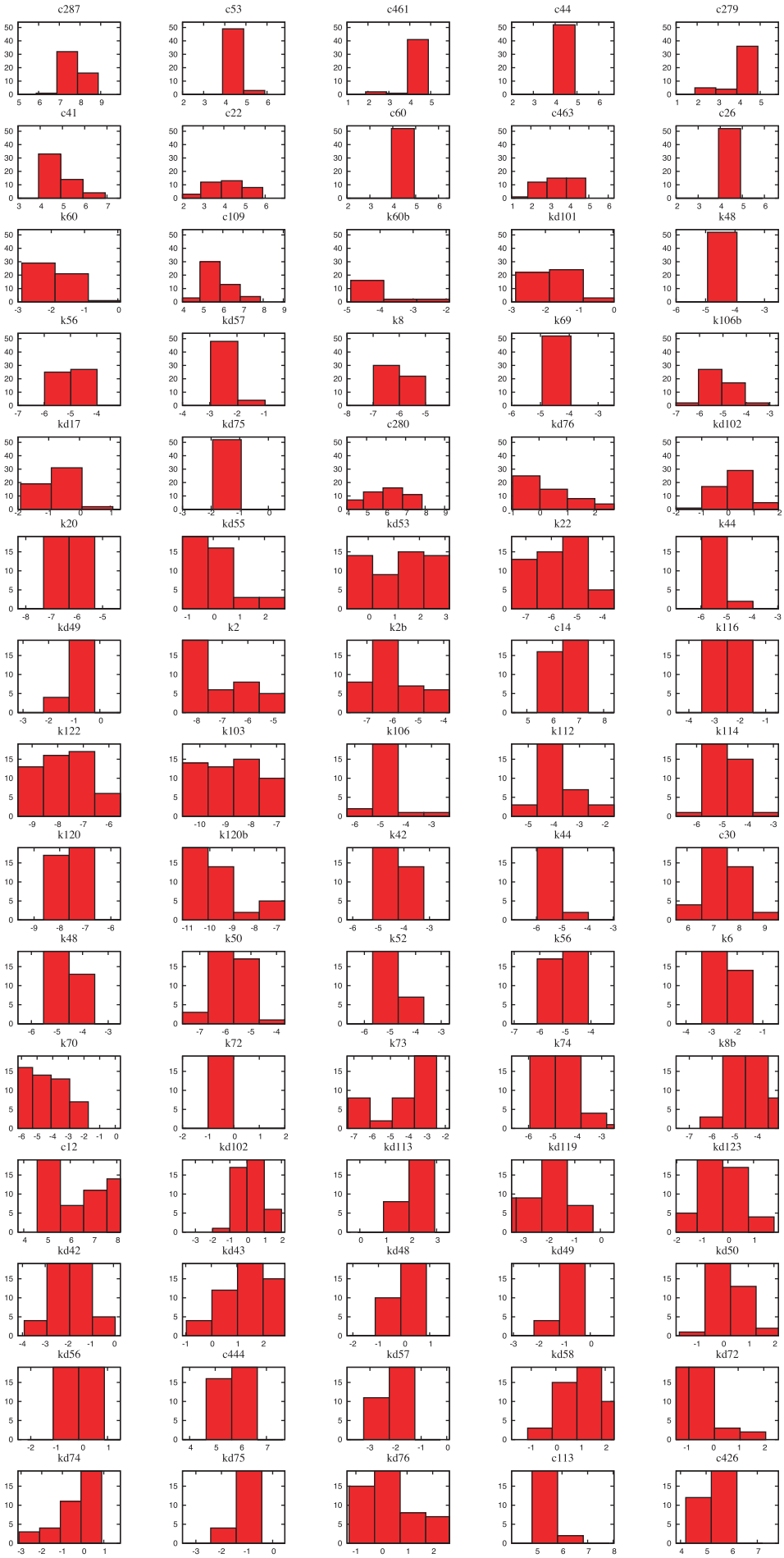
k_{-40} 6.40e-02 /s
k_{-41} 4.29e-02 /s
k_{-42} 1.42e-02 /s
k_{-43} 3.16e+01 /s
k_{-44} 1.83e-02 /s
k_{-45} 1.90e+00 /s
k_{-47} 8.00e-01 /s
k_{-48} 7.90e-01 /s*
k_{-49} 1.12e-01 /s
k_{-50} 0.8 /s *
k_{-52} 3.30e-02 /s
k_{-53} 2.80e-01 /s
k_{-55} 7.02e+01 /s
k_{-56} 1.46e-5 /s *
k_{-57} $k_{56} * 6.00e23 * 1.00e-12 * 6.00e-08 - k_{-56}$ /s *
k_{-58} $k_{48} * 6.00e23 * 1.00e-12 * 6.00e-08 - k_{-48}$ /s *
k_{-60b} 0.00e+00 /s
k_{-60} 0.00e+00 /s
k_{-61} 0.00e+00 /s
k_{-63} 2.75e-01 /s
k_{-64} 3.00e-01 /s
k_{-65} 2.00e-01 /s
k_{-66} 2.00e-01 /s
k_{-67} 2.00e-02 /s
k_{-68} 2.00e-01 /s
k_{-68b} 2.05e+01 /s
k_{-69} 1.00e-01 /s
k_{-70} 1.00e-01 /s
k_{-71} 2.52e+01 /s
k_{-72} 5.01e+00 /s
k_{-73} 8.33e-7 /s *
k_{-74} 2.00e-1 /s *
k_{-75} 1.00e-1 /s *
k_{-76} 1.42e+02 /s
k_{-94} 1.00e-02 /s
k_{-95} 3.30e+01 /s
k_{-96} 1.00e-01 /s
k_{-97} 1.50e-02 /s
k_{-97c} 1.00e-03 /s
k_{-98} 1.00e-03 /s
k_{-99} 5.00e-01 /s
k_{-100} 1.00e-03 /s
k_{-101} 3.00e-02 /s
k_{-102} 5.61e+00 /s
k_{-103} 1.60e-02 /s *
k_{-104} 2.00e-01 /s

k_{-105} 1.00e-01 /s
k_{-106b} 1.00e-01 /s
k_{-106} 1.00e-01 /s
k_{-107} 1.00e-01 /s
k_{-108} 5.00e+00 /s
k_{-109} 1.00e-01 /s
k_{-110} 1.00e-01 /s
k_{-111} 6.57e+00 /s
k_{-112} 1.00e-01 /s
k_{-113} 1.78e+02 /s
k_{-114} 1.00e-01 /s
k_{-115} 1.00e+00 /s
k_{-116} 0.00e+00 /s
k_{-117} 1.00e-01 /s
k_{-118} 3.00e-02 /s
k_{-119} 1.03e-02 /s
k_{-120} 1.00e-01 /s *
k_{-120b} 1.00e-01 /s *
k_{-122} 1.00e+00 /s *
k_{-123} 1.78e-01 /s

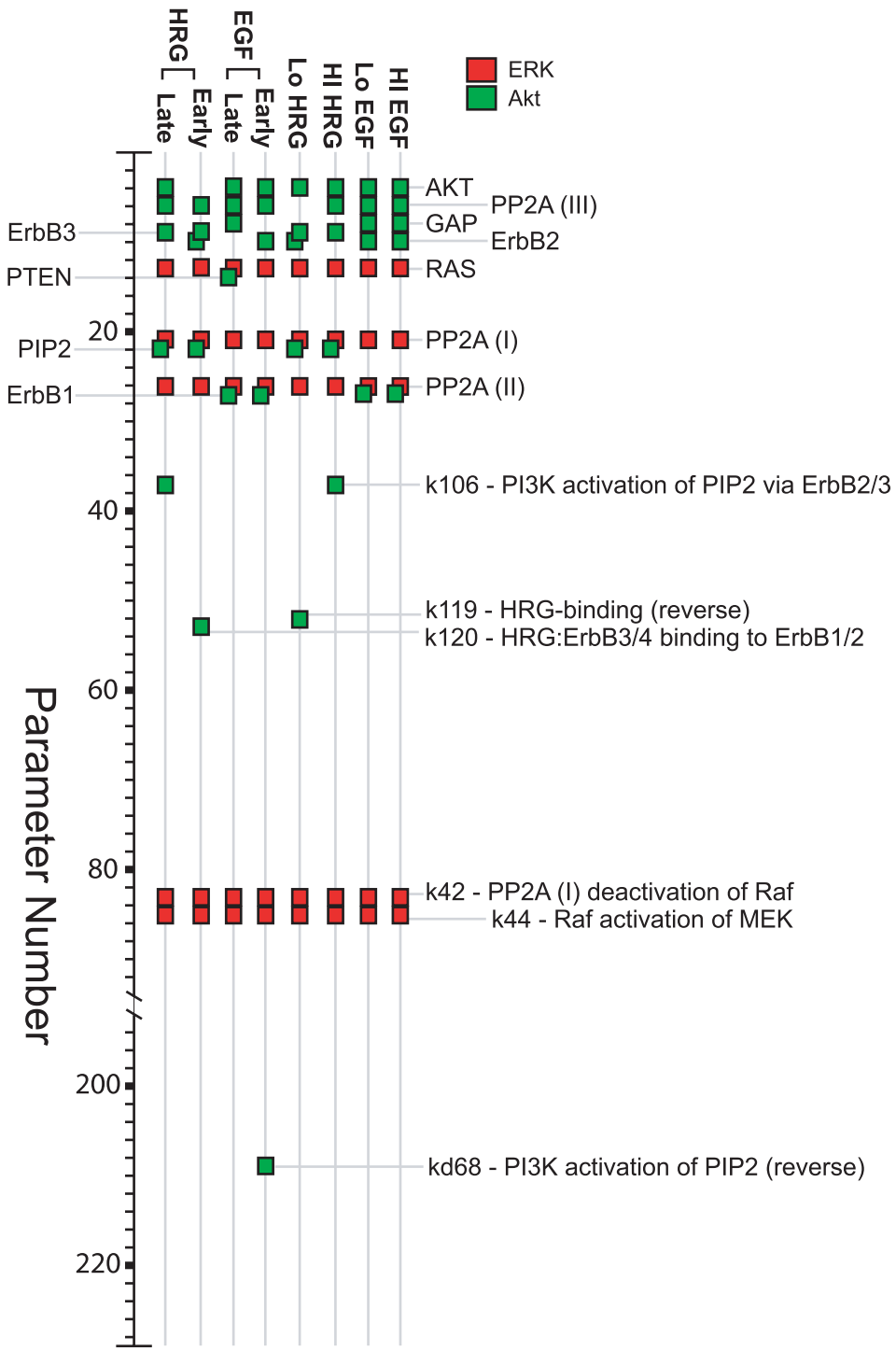
* These constants are 0 during inhibitor pre-incubation



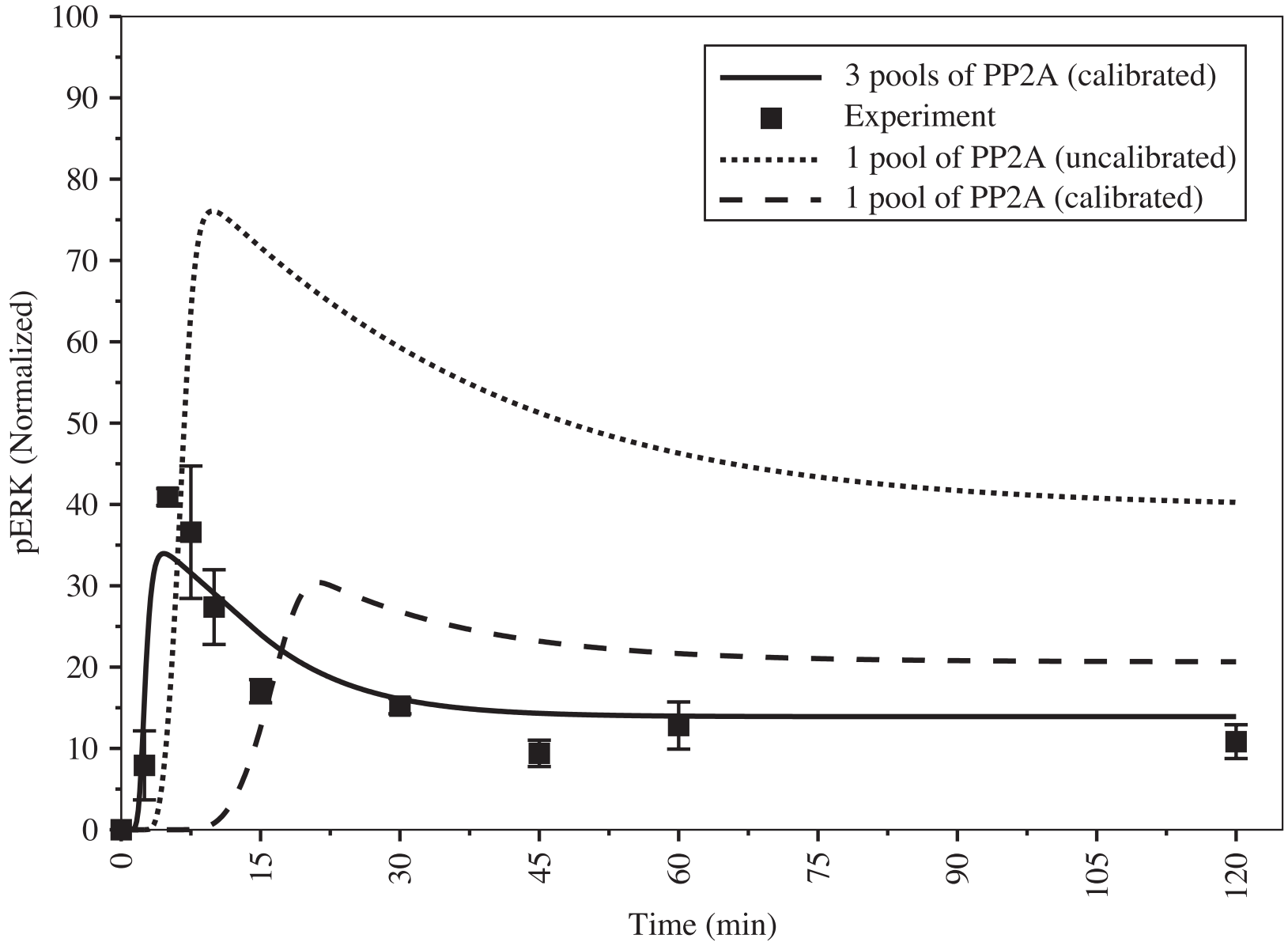
SFigure 3. The dynamics of a model that has been fitted to synthetic data. Points indicate the synthetic data, generated from a hand-fitted A431 IERMv1.0. Lines indicate the dynamics of a model that has been refitted, using simulated annealing, to the synthetic data.



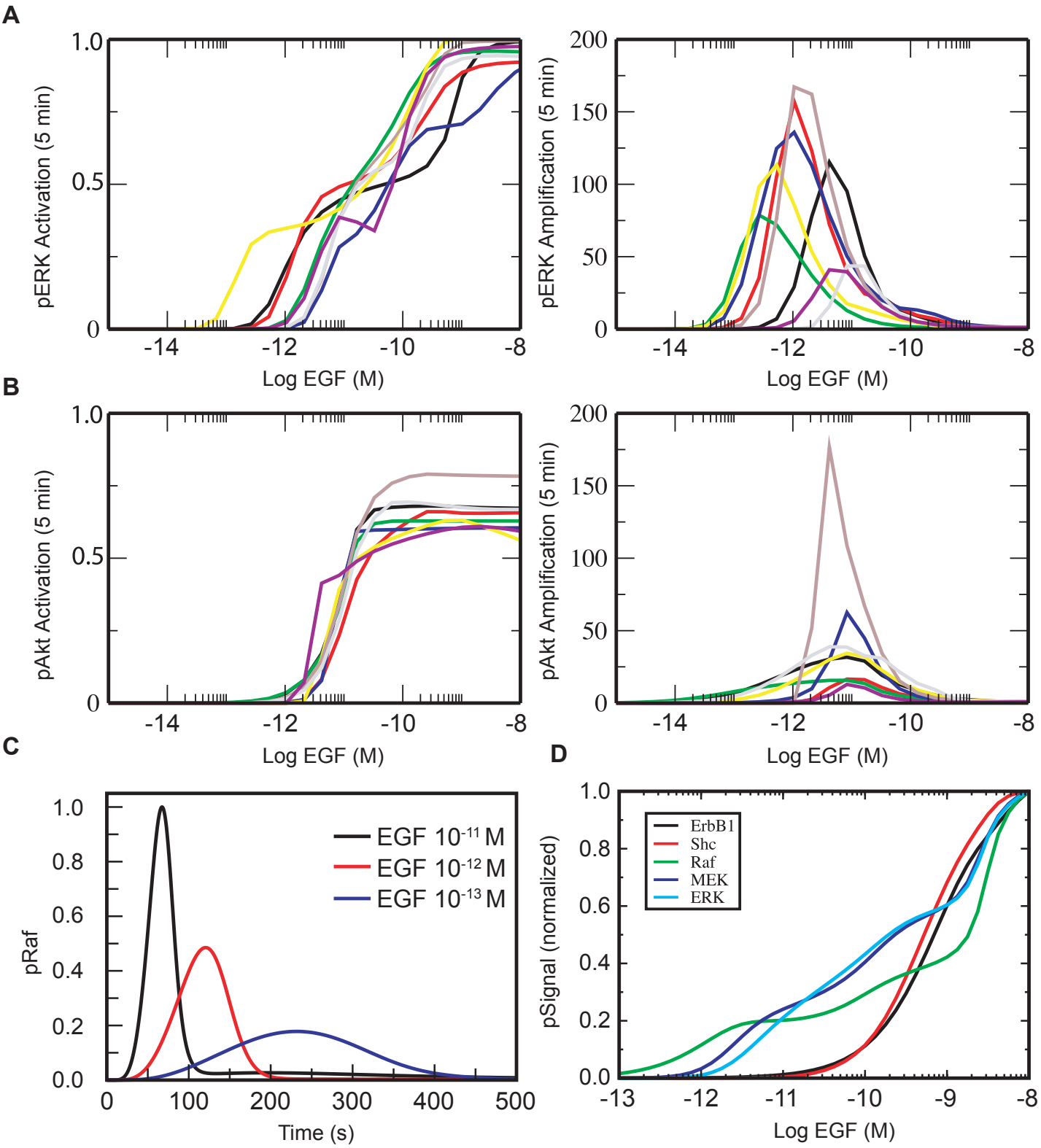
SFigure 4. Distributions of parameter values of the ErbB model fitted to A431 line. Distributions are generated from repeated parameter optimization runs (by simulated annealing). The x-axis is the parameter value (either an initial concentration or a rate constant) on a log-scale.



SFigure 5. Sensitive rate constants and protein initial concentrations of the IERMv1.0 model fitted to A431 dynamics, according to time, feature or type of stimulus. Parameters are numbered 1-225. The rate constants comprise 1-199, and the protein initial concentrations comprise 200-225. Sensitive parameters are noted by a box positioned at the corresponding numbered position along a vertical axis. Each vertical axis corresponds to a time, feature or type of stimulus. Red boxes indicate parameters sensitive for pERK dynamics, green boxes for pAkt.



SFigure 6. Dynamic trajectories for pERK stimulated by 1 nM HRG in IERMv1.0 fits to A431 data with alternate phosphatase 2A reaction compartmentalization. Solid line – predicted pERK dynamics in a baseline model having three different reaction compartments of PP2A, as described in the text; square points denote data collected from A431 cells stimulated with 1nM HRG; dotted line - dynamics from the same fit but forced to have a single reaction compartment of PP2A; dashed line – ERK dynamics from a fit having a single reaction compartment of PP2A but recalibrated against experimental data.



SFigure 7. Predicted Hill coefficients and the ErbB responses. (A) Model fits showing dose-response of pERK with low (<1) Hill coefficients (left panel) and amplification as defined by Eqn. 5 (right panel). (B) Model fits showing EC50 of pAkt with low (<1) Hill coefficients (left panel) and amplification as defined by Eqn. 5 (right panel). (C) Predicted pRaf activation over time under 3 concentrations of EGF. (D) Predicted dose response of different levels of the MAPK pathway in the A431 fit of IERMv1.0 model. The dose response of early events (pErbB1 and pShc) cluster into one group, showing rapid die-off at low levels of ligand (10-11 M). The dose response of the late events (pMEK and pERK) cluster into another group, showing amplification at low levels of ligand. The dose response of an intermediary signal (pRaf) shows biphasic behavior, at high concentrations of ligand reflecting the early event amplification profile and at low concentrations reflecting the late event amplification profile.