



Figure S1: **Size and velocity slopes as a function of different time delays for different weights of prior size ( $w_s$ ).** The dashed line denotes velocity slopes ( $a_v$  in absolute value to be matched against size slopes) and red solid lines denote size slopes ( $a_s$ ) for different  $w_s$  that intersect with velocity slopes. For the sake of illustration only four intersecting curves that correspond to four different values of  $w_s$  are shown in the figure. In the real fitting the sampling of  $w_s$  was higher (see text). (insets) histograms of the intersecting size slopes (in red) and the corresponding  $t_{delay}$  both obtained after a complete iteration procedure ended. Dotted lines in the main figure connect the mean slope on size (estimated from the red histogram) and the corresponding  $t_{delay}$  estimated from the blue histogram.