



Figure S2: Back-in-time Markov process for generating a coalescence time  $T_2$  at the right locus conditional on the time  $T_1 = t_1$  at the left locus under the SMC'. Starting at time zero in state  $R_0$ , the process follows the transitions indicated by the solid arrows at the rates accompanying these arrows. Transitions indicated by dotted arrows are followed instantaneously at time  $t_1$ . See HOBOLTH and JENSEN (2014) for analogous processes for the ARG and SMC models.