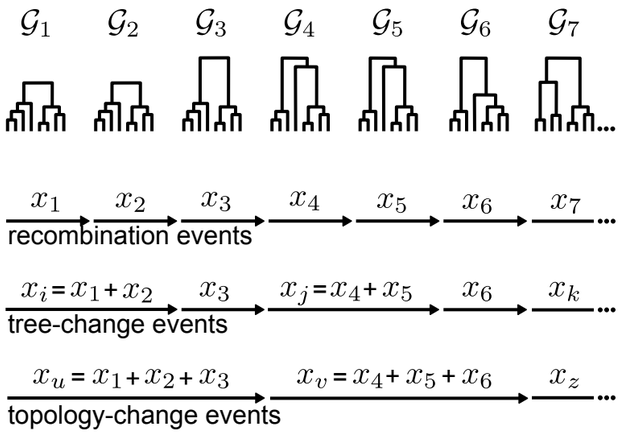
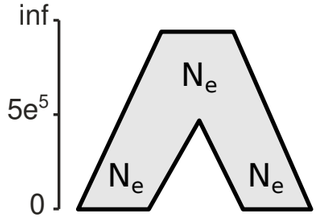
(A) Proposed ARG



(B) Parameterized MSC model ( )



(C) Extract trees between each event type

$$G_r = [\mathcal{G}_1, \mathcal{G}_2, \mathcal{G}_3, ...]$$

$$G_g = [\mathcal{G}_1, \mathcal{G}_3, \mathcal{G}_4, ...]$$

$$G_t = [\mathcal{G}_1, \mathcal{G}_4, \mathcal{G}_7, ...]$$

(D) Extract lengths between each event type

$$X_r = [x_1, x_2, x_3, ...]$$

$$X_g = [x_i, x_3, x_j, ...]$$

$$X_t = [x_u, x_v, x_z, ...]$$

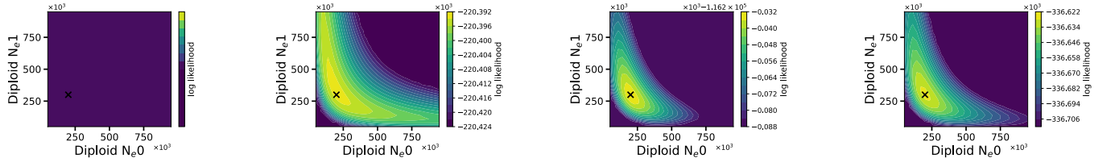
(E) Calculate an MS-SMC rate parameter for each event type given S, G, and recomb rate

$$\Lambda_r = [\lambda_{r1}, \lambda_{r2}, \lambda_{r3}, ...]$$

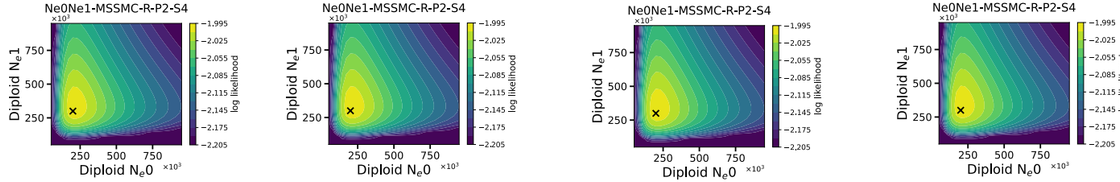
$$\Lambda_g = [\lambda_{g1}, \lambda_{g3}, \lambda_{g4}, ...]$$

$$\Lambda_t = [\lambda_{t1}, \lambda_{t4}, \lambda_{t7}, ...]$$

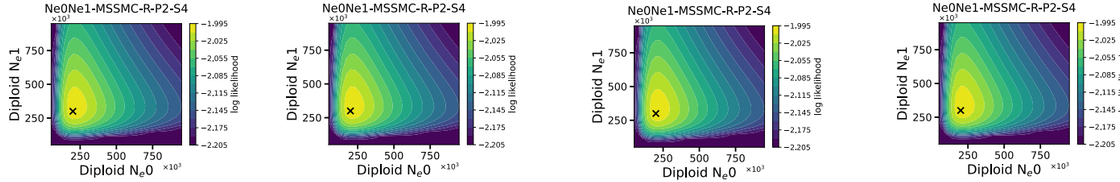
(F) Likelihood surface of (Ne0, Ne1) inferred by MS-SMC (waiting distances)



(G) Likelihood surface of (Ne0, Ne1) inferred by MSC (coalescent waiting times)



(H) Likelihood surface of (Ne0, r) inferred by MS-SMC (waiting distances)



(I) Likelihood surface of (Ne0, r) inferred by MSC (coalescent waiting times)