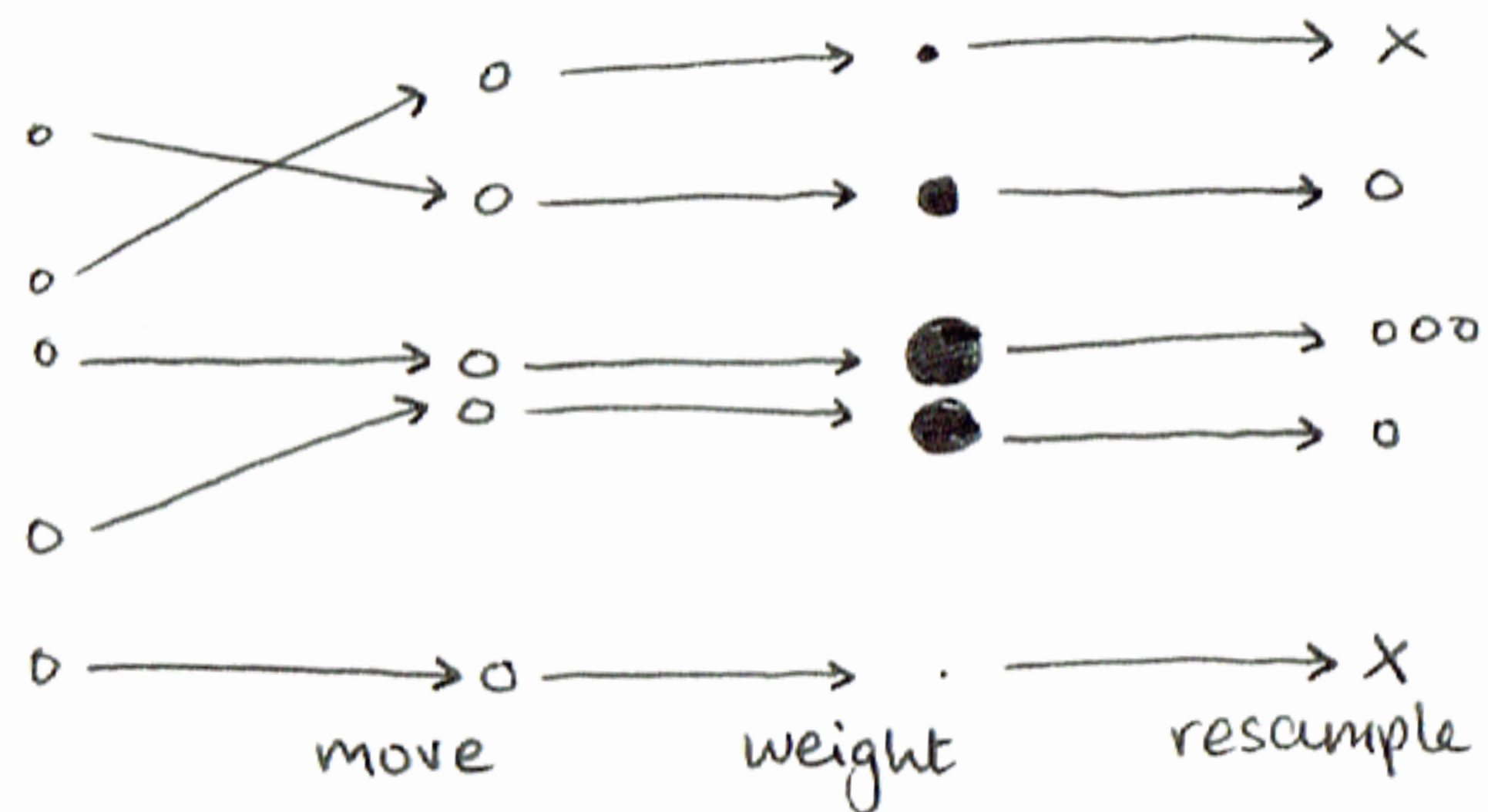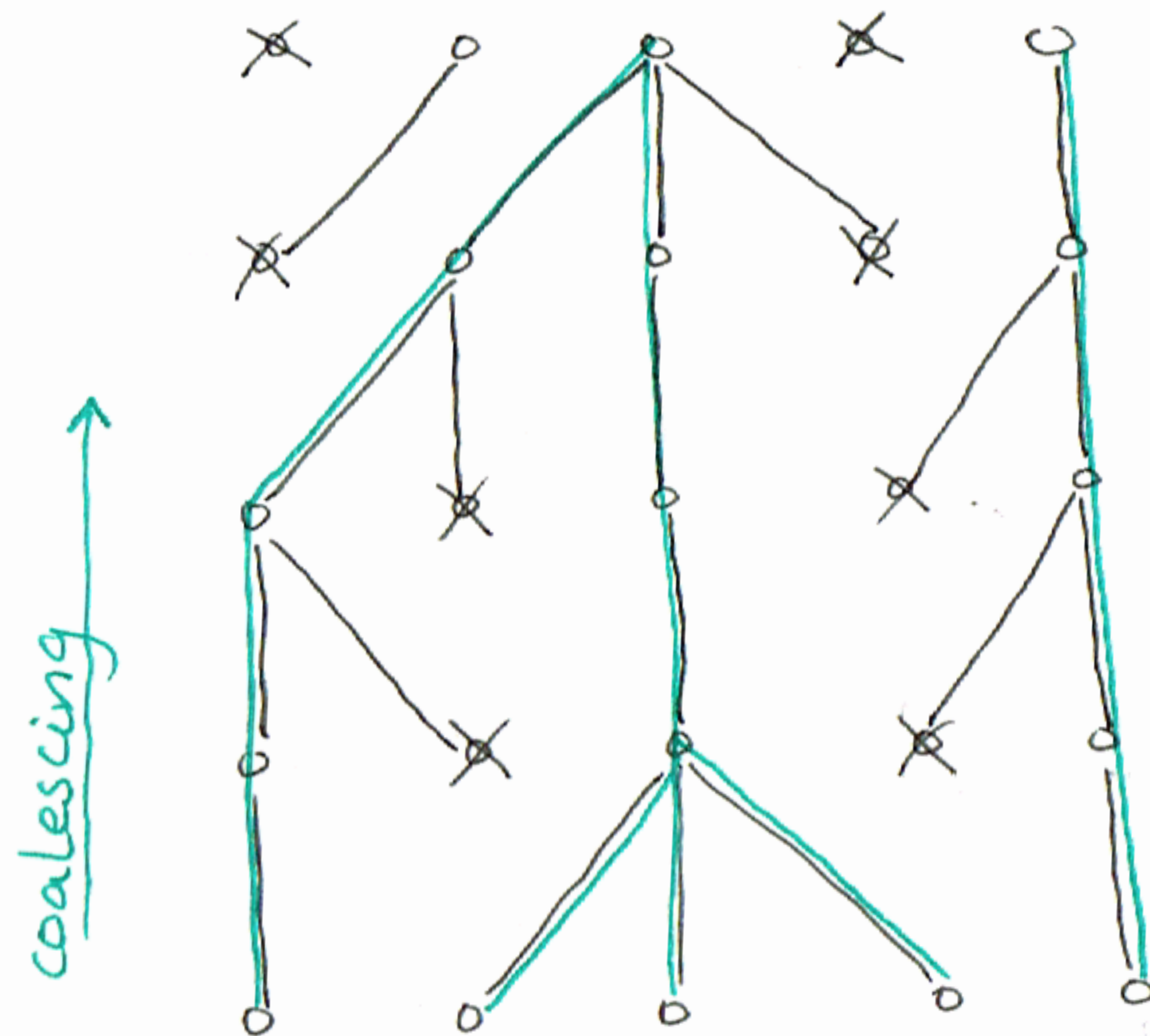# Sequential Monte Carlo

move weight resample

The induced genealogy is directly related to performance of the SMC algorithm.

Resampling induces a genealogy

coalescing

Theorem

- Scale time by $C_N(\cdot)$
- condition ensuring multiple mergers ($\wedge\wedge$ and $\wedge$) vanish
- number of particles $N \to \infty$
- then genealogies of n randomly sampled particles $\longrightarrow$ "n-coalescent" (every pair of lineages merges at rate 1)
- convergence in sense of finite-dimensional distributions

Holds for:

- multinomial resampling (previous work)
- "stochastic rounding"-based resampling (includes most low-variance schemes)
- conditional SMC with multinomial resampling

Current focus: strengthening mode of convergence from FDDs to weak convergence