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Genealogies for a biased voter model.

I will present rigorous results about the genealogies of a biased voter model introduced by Hallatschek and Nelson (2007). To investigate the lineage dynamics, we derived a system of stochastic partial differential equations (SPDE) from the tracer dynamics in which the particles have different colors. Brunet et al. (2006) have conjectured that genealogies in models of this type are described by the Bolthausen-Sznitman coalescent. However, there are no simultaneous coalescences in our model, since the dual branching coalescing random walk converges to a branching Brownian motion in which particles coalesce after an exponentially distributed amount of intersection local time. A new duality equation is established to show uniqueness of the SPDE. By generalizing results of Mueller and Tribe (1995), we also identified different scalings for which our biased voter model converges to either the Wright-Fisher SPDE or the deterministic FKPP. Joint work with Rick Durrett. (Received January 19, 2018)