

Genealogies in models of evolution

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It has been known for a long time that genealogies in simple models of neutral evolution are described, for a large population, by Kingman's coalescent. In presence of selection, genealogies belong to a different universality class and their statistics of the genealogies follow those of the Bolthausen-Sznitman coalescent. Therefore the genealogies, in presence of selection, have the same tree structure as what the Parisi theory predicts for the pure states of mean field spin glasses. This analogy between models of evolution and spin glasses breaks down when one conditions the genealogies on the speed of evolution.