Tree Valued Spatial Λ-Cannings Dynamics

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KEY WORDS: Tree-valued Markov process, Cannings model, generalized Fleming-Viot, spatial -coalescent, metric probability space, Gromov-weak topology

MATHEMATICAL SUBJECT CLASSIFICATION: 60K35, 60J25

Abstract: We study the evolution of genealogies for interacting spatially structured Λ-Cannings models which are also known as generalized Fleming-Viot processes. These are the limit processes of individual-based population models where individuals carry a type, and are replaced by descendants of possibly very sizable offspring. The spatial interaction is due to migration through geographic space.

We show that the dual to these tree-valued spatial Λ-Cannings dynamics are tree-valued spatial Λ-coalescents, and conclude from here the convergence of the fixed time genealogies to the genealogy of an infinitely old population as time tends to infinity. Depending on the strength of migration the latter consists either of a single or of multiple families.

We then study the populations on large tori in Z^d with $d \geq 2$. Depending on the rescaling we find global features which are universal for all Λ-Cannings dynamics and local features which heavily depend on the measure Λ.