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Spectral methods for bivariate Markov processes with diffusion and discrete components and a variant of the Wright-Fisher model

Manuel D. de la Iglesia

(Submitted on 19 Jul 2011)

The aim of this paper is to study differential and spectral properties of the infinitesimal operator of two dimensional Markov processes with diffusion and discrete components. The infinitesimal operator is now a second-order differential operator with matrix-valued coefficients, from which we can derive backward and forward equations, a spectral representation of the probability density, study recurrence of the process and the corresponding invariant distribution. All these results are applied to an example coming from group representation theory which can be viewed as a variant of the Wright-Fisher model involving only mutation effects.

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