

Moment Equations for a Spatially Extended System of Two Competing Species

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We study the dynamics of a spatially extended system of two competing species, in the presence of two noise sources: a correlated dichotomous noise acting on the interaction parameter and a multiplicative white noise which affects directly the dynamics of the two species[1]. We use a coupled map lattice (CML) model[2] to obtain a discrete version of Lotka-Volterra (LV) equations[3]. We write them in a mean field form and we get the corresponding moment equations in Gaussian approximation[4]. In this formalism we analyze the system dynamics for different values of the multiplicative noise intensity. Finally we compare our theoretical results with those obtained by direct simulations of the LV equations in the CML model.

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