

Approximate reduction of multiregional models governed by linear stochastic differential equations

Luis Sanz¹ and Juan Antonio Alonso² .

In this work we extend approximate reduction techniques to the context of time-continuous multiregional models governed by stochastic differential equations in which migration is a fast process with respect to reproduction-growth. We deal with an age structured population evolving in a multi-patch environment according to a linear model in such a way that the process of growth is subjected to the effect of stochasticity modelled by white-noise. By assuming that the process of migration is fast with respect to reproduction-growth, we can reduce the original set of stochastic differential equations to a reduced set of equations. Moreover we provide results that relate the asymptotic behaviour of the original model to that of the reduced model.

¹Departamento de Matemáticas, E.T.S.I. Industriales, U. Politécnica de Madrid José Gutiérrez Abascal 2. 28806 Madrid, Spain (e-mail: lsanz@etsii.upm.es).

²Departamento de Matemáticas, E.T.S.I. Industriales, U. Politécnica de Madrid José Gutiérrez Abascal 2. 28806 Madrid, Spain (e-mail: jalonso@etsii.upm.es).