Some results and open problems related to the longterm behaviour of the symbiotic branching model

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The symbiotic branching model describes the spatial stochastic evolution of two species which can only reproduce (locally) if both are present at the same site. The two populations are coupled both via the variance of the reproduction mechanism as well as via their driving noises in terms of a correlation parameter ϱ. Interestingly, this model provides a unifying framework for various well-known population models, such as the stepping stone model, the mutually catalytic branching model, a version of the parabolic Anderson model and the voter model.

We aim to understand aspects of the longterm-properties of these models. A crucial object will be a so-called critical curve, governing the moment asymptotics in terms of ϱ. We present some recent results as well as open problems. This is joint work with A. Etheridge and L. Doering.