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*Bifurcation theory of well-mixed stochastic population models*

The bifurcation theory of ordinary differential equations (ODEs), and its application to deterministic population models, are by now well established. In this article, we begin to develop a complementary theory for well-mixed stochastic population models, with the goal of understanding the scale, in both time and population density, of fluctuations near bifurcation points of the underlying deterministic system. To do so we study the ODE and SDE limits that arise in the vicinity of bifurcation points and discover that they can be neatly classified in a bifurcation diagram that complements and enhances the deterministic theory. We focus on one-dimensional bifurcations, although the general approach is extensible to higher dimensions.