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A mean field approach to Z_N-enhanced generalized May-Leonard models[1] SHAHIR MOWLAEI, AHMED ROMAN, MICHEL PLEIMLING, Virginia Tech — May-Leonard (ML) models have been used to describe the rich dynamics of a range of systems in biology and ecology. In this report we study a class of extended cyclic ML models of N species in the mean field limit, enhanced with Z_N symmetry, and investigate the space of their (unstable) coexistence fixed points. We start with a brief review of the well studied ML model of three species, expand on the generalized class and provide expressions for the unstable invariant manifold near single fixed points of a subclass of the mentioned extensions. For the purely cyclic ML model with an odd number of species we derive the complex Ginzburg-Landau normal form.

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