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Title: Shadowing of non-transversal heteroclinic chains

Abstract:

We discuss a geometric method for the shadowing of nontransversal chain of heteroclinic connections based on the idea of dropping dimensions.

In our picture we think of evolving a disk of dimension k along a heteroclinic chain and when a given transition is not transversal, then we 'drop' one or more dimensions of our disk, i.e., we select a subdisk of lower dimension "parallel to expanding directions in future transitions". After at most k transitions, our disk is a single point and we cannot continue further. We will refer to this phenomenon as the *dropping dimensions* mechanism.

We illustrate this new mechanism for a generalization of toy model systems introduced by Colliander and all, Guardia and Kaloshin, Guardia-Hauss-Processi in the study of the energy transfer to high frequencies in the cubic defocusing nonlinear Schrödinger equation.