



Accelerating cycle expansions by dynamical conjugacy

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Periodic orbit theory provides two important functions---the dynamical zeta function and the spectral determinant for the calculation of dynamical averages in a nonlinear system. Their cycle expansions converge rapidly when the system is uniformly hyperbolic but greatly slowed down in the presence of non-hyperbolicity. We find that the slow convergence can be associated with singularities in the natural measure. A properly designed coordinate transformation may remove these singularities and results in a dynamically conjugate system where fast convergence is restored. The technique is successfully demonstrated on several examples of one-dimensional maps and some remaining challenges are discussed.

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