
JASON MIRELES JAMES, Florida Atlantic University

Validated computation of connecting orbits in infinite dimensions

I will discuss some computer assisted arguments which establish the existence of connecting orbits for infinite dimensional dynamical systems. The idea is to study a nonlinear operator describing orbits which begin on the local unstable manifold of one hyperbolic fixed point and terminate on the local stable manifold of another. Good numerics lead to approximate zeros of this operator, and the existence of a true zero is obtained by showing that a related Newton-Like operator is a contraction in a suitable neighborhood of the numerical approximation. A critical point is that validated local analysis of the fixed points, their spectra/eigenspaces, as well as their local stable/unstable manifolds are needed in order to frame the analysis. I will show results involving a model of population dynamics with seasonal spatial dispersion.