

Computing invariant dynamics for delay differential equations

Jason Mireles James

Abstract

In this talk I will review the notion of a delay differential equation and explain why they lead to infinite dimensional rather than finite dimensional dynamics. Then I'll discuss some methods, based on the parameterization method of Cabre, Fontich, de la Llave, and Haro, for numerical computation of certain invariant sets for these systems. I'll focus on unstable manifolds attached to equilibrium solutions, but I may also say something about unstable periodic orbits and chaotic dynamics as well. I'll illustrate the use of these methods in some explicit application problems.