1044-34-212 **Stephen Schecter*** (schecter@math.ncsu.edu), Department of Mathematics, North Carolina State University, Box 8205, Raleigh, NC 27608, and **Christos Sourdis** (schristos@dim.uchile.cl), Departamento de Ingenieria Matematica, Universidad de Chile, Santiago, Chile. *Heteroclinic solutions of a singularly perturbed Hamiltonian system representing anisotropic crystalline phase interfaces in alloys.* Preliminary report.

We consider the existence of heteroclinic solutions for a Hamiltonian system consisting of a pair of second-order ODEs. Such a solution represents a planar interface between disordered and ordered states in a multiple-order-parameter phase-field model for phase interfaces in alloys with FCC (face-centered cubic) crystalline structure. The pair of second-order ODEs has a parameter $1/\epsilon^2$ that represents degree of anisotropy. In the limit $\epsilon = 0$, the slow manifold fails to be normally hyperbolic, due to a pitchfork bifurcation in the fast equation. Existence of the heteroclinic solution was shown by Sourdis and Fife (Advances in Differential Equations 12 (2007), 623–668) using a functional analytic approach. We show how the same result can be obtained by geometric singular perturbation theory, using blow-up to resolve loss of normal hyperbolicity in the slow manifold. The advantage of this approach is that it makes the matching of inner and outer solutions more transparent. (Received September 02, 2008)