Abstract

We describe numerical methods for the location of the zero set of the periodic Evans function $D(\xi, \lambda)$ for $\lambda, \xi$ sufficiently small, or equivalently the spectrum of a linearized operator $L$ with periodic coefficients through the homogenization. We demonstrate these methods for an example system, van der Waals gas in eulerian coordinates. We observe the hyperbolicity of the system. The hyperbolicity is necessary to show asymptotic behavior of a multi-dimensional single periodic wave of systems of conservation laws with viscosity under small perturbation.