The Existence of Transition Profiles for Compressible Flows

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Abstract:
We consider diffusive interface models describing flows which undergo a phase change. The equations consist of the compressible Navier-Stokes system coupled with an Allen-Cahn equation (phase field equation), and are based on an energetic variational formulation. We concentrate on a model where in the sharp interface limit a jump arises in the mass density on the free boundary. Here, the central point is the evaluation of the transition profiles in the interface region connecting the both bulk regions. In this talk we show the existence of such transition profiles for a special class of given double well potentials W. Further we carry out the formal incompressible limes of the compressible Navier-Stokes system in order to compare the results with existing incompressible two phase flow models.