Anomalous Wave Structure in Diverging Geometry by Non-convexity of the Equation of States

KYUWAN HWANG, Agency for Defense Development — It is well known that a non-convex equation of states (EOS), which is defined by Thompson’s “fundamental derivative” $G$ being negative, can be developed for materials near phase transition, or plasma under specific conditions. Non-convexity of EOS leads to anomalous wave structure including rarefaction shock and composite waves as solution of the scale-invariant Riemann problem in flat geometry. This phenomenon is well understood and compiled into excellent review papers, for example Menikoff and Plohr. Recently, a numerical study is performed using a model EOS by Heuze, at. al. In this presentation, we studied numerically the anomalous wave structure developed by non-convex EOS in the system with geometric divergence, which breaks the scale invariance assumption.

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