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Stability and ambiguous representation of shock wave discontinuity in media with arbitrary thermodynamic properties ALEXANDER LIKHACHEV, ANDREY KONYUKHOV, VLADIMIR FORTOV, Joint Institute of High Temperatures, Russian Academy of Sciences, ALEXEY OPARIN, Institute for Computer-Aided Design, Russian Academy of Sciences, SERGEY ANISIMOV, L.D. Landau Institute for Theoretical Physics, Russian Academy of Sciences — The non-linear analysis of the plane shock wave stability in media with arbitrary equation of state has been carried out numerically in a systematic way. The simulation has been conducted in the viscous one- and multi-dimensional formulations. The real and properly constructed model equations of state have been used in calculations. The behavior of neutrally stable shock waves as well as shocks in the region of their ambiguous representation overlapped Hugoniot segments meeting the linear criteria of the shock wave instability [D'yakov, Zh. Eksp. Teor. Fiz. **27**, 288 (1954)] has been studied. It is shown that unlike linear theory predictions the neutrally stable shock wave perturbations are damped but this process is rather slower than in the case of the absolutely stable shock wave. Within regions of ambiguous representation shocks split with irreversible transition to one of admissible wave configurations. The formation of a cellular detonation-like front structure has been revealed in multi-dimensional simulation (the region of ambiguous shock representation due to instability condition L>1+2M).

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