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Stability of shock waves in anisotropic hydrodynamics

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Hot and dense hadronic matter created in the early stages of relativistic heavy-ion collisions has strong spatial anisotropy. The rapid expansion of matter along the beam-axis in the first moments after the collision leads to a strong drop in the ratio of longitudinal and transverse pressures. One of the hydrodynamic descriptions of such a system is the anisotropic approach, in which the anisotropy parameter is explicitly introduced for the one-particle distribution function.

The question of how to generate shock waves in a quark-gluon plasma is still open, but it is clear that they exist in such a medium, that is very well described by hydrodynamic equations. Shock waves are closely related to the jet quenching effect and hadronization; therefore, it is especially interesting to study them in the context of anisotropic system. Registration of shock waves in matter created in relativistic collisions of heavy nuclei directly depends on the degree of their stability. The stability of shock waves has not yet been studied for anisotropic hydrodynamics.

The purpose of this report is to highlight the problem of shock wave stability in anisotropic relativistic hydrodynamics. The influence of small perturbations on the behavior of the discontinuity surface will be considered, and the dependence of this behavior on the anisotropy parameter will also be studied.

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