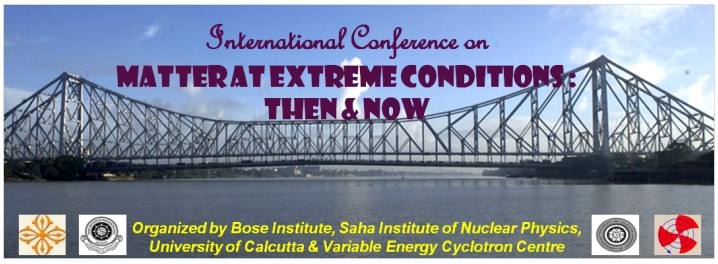

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On realizability of relativistic acoustic geometry under a generalized perturbation scheme for matter flow onto a Schwarzschild black hole.

Friday 17 January 2014 10:55 (15 minutes)

It is a general practice in the community to study the stationary solution for matter flow on an astrophysical Schwarzschild black hole since at the close proximity of the event horizon, in-falling matter encounters extreme conditions due to the strong curvature of the space time and hence a full space time dependent dynamics of such matter at extreme state is not possible to examine within the analytical framework. The main issue, however, in this approach is, whether the stationary solutions of the aforementioned physical configuration are stable. We introduce a novel stability analysis scheme within the framework of Einstein's theory of gravity which can address the aforementioned issue. Using our linear perturbation analysis scheme, we study the stability properties of the curved acoustic manifold embedded within the background fluid configuration and investigate the influence of the introduction of the higher order perturbation in destabilizing the associated relativistic acoustic geometry.

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