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Pushing fluid dynamics beyond its limits

Sunday 6 November 2016 11:00 (20 minutes)

The one-dimensional non-boost-invariant evolution of the quark-gluon plasma is analyzed within various frameworks of dissipative fluid dynamics. Predictions of all studied models are similar in the midrapidity region which stays in agreement with recent comparison of their gradient expansions, see arXiv:1608.07558. On the other hand, they differ significantly in the forward/backward region where, in the case of standard viscous formalisms, the plasma undergo large pressure corrections. Their magnitude strongly depends on the particular choice of the second-order terms included, which suggests that the latter should be included in the most complete way. The undesirable growth of viscous corrections results also in the generation of shock fronts which, when applied in event-by-event simulations may distort final results. Both large corrections and shocks are self-regulated in the anisotropic hydrodynamics approach, which uses reorganized hydrodynamic expansion around anisotropic background.

Reference:

W. Florkowski, R. Ryblewski, M. Strickland, L. Tinti, arXiv:1609.06293

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