Title:	Shear viscosity over entropy density calculation in heavy ion collision
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Abstract:	In Heavy Ion Collision Quark-Gluon Plasma(QGP) are formed, and at extremely dense conditions, it behaves like a superfluid, but unfortunately, we do not have complete access to its properties like temperature, equation of state, transport co-efficient etc., we are only able to get the information about the spectra of final state particles. QGP is also character- ized by a very small shear viscosity to entropy density ratio (η/s), which is predicted as a lower bound with the help of Anti-deSitter space/Conformal Field (Ads/CFT) theory and it is expected to be within 0.08-0.24 range with different initial conditions. While trying to reconstruct QGP like phenomena in a lab environment, we will work with relativistic √ heavy-ion collision (RHIC) particularly, Pb-Pb collisions in s N N = 2.76 TeV. In the con- text of RHIC, the study of shear viscosity is significant as it drives a non-equilibrium system towards its equilibrium. The equilibration of momentum anisotropy, converted from spatial anisotropy in the nuclear collision, is one of the crucial aspects that govern by shear viscos- ity co-efficient. In the evolution of RHIC, as the system in QGP state expands and cools off, it tries to get through a phase transition from quark-gluon to hadronic gas phase with a rapid increase in η/s. We calculate the quantity - η/s as a function of varying centrality to verify the lower value predicted for QGP also holds for hadron gas. We also try to observe if centrality (or impact parameter) for a particular type of collision does have any effect on η/s value for hadron gas.
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