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Anisotropic collective flows in a kinetic transport theory at fixed η/s(T)

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The Relativistic Heavy-Ion program has shown that a key properties of the QGP is its very low shear viscosity to density entropy ratio η/s(T). A key observable is supplied by the different harmonics of the collective flows $v_n(p_T)$. We present a transport approach, developed with η/s(T) as an external parameter similarly to the hydrodynamical approach, able to naturally describe the $v_n(p_T)$ in a wide range of p_T and η/s(T) (including the rise and fall observed at LHC).
Furthermore kinetic theory allows to implement properly the non-equilibrium Color Glass Condensate conditions determined by the Q_S saturation scale. We find that in the build-up of $v_2(p_T)$ the initial non-equilibrium distribution significantly compensates the larger space eccentricity of the CGC respect to the Glauber modeling.
We will show, exploring the T dependence of η/s(T), that a study of v_n allows to understand the differences behind the build of collective flows from low energy scan at RHIC to LHC energies. Finally we will show that including a mean field dynamics from quasi-particle model the dynamics evolves according to recent lattice QCD equation of state and predicts a chemical evolution from gluon to quark dominance close to T_c.

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