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First results from hybrid HKM for top RHIC and LHC energies

The hydrokinetic approach [1,2] to A+A collisions describes hydrodynamic expansion of systems created in A+A collisions and their dynamic decoupling according to particle liberation probabilities in a way inspired by Boltzmann equation. The up-to-date version of hydro-kinetic model include the realistic features of heavy ion collisions typical for RHIC and LHC energies in the way directed by the papers [3,4]:

- The equation of state (EoS) is constructed for the case of crossover QGP-HG phase transition and combines lattice-QCD inspired results for QGP phase and ideal gas mixture of all hadron species, well-established by Particle Data Group (326 sorts).
- Gradual decay of short-lived resonances into expanding hadronic system according to their widths define the composition of the gas and hence its EoS at each space-time points. The decays contribute also to emission function and hence to the particle spectra.
- The cross-sections and collision rates in the hadronic gas are calculated in accordance with the UrQMD model.
- Initial conditions for hydrodynamic evolution are taken from Glauber or CGC approaches.

Switching to the transport code (UrQMD) is performed at the space-like hypersurface with essentially non-equilibrium hadron distribution functions calculated in hydro-kinetic approach. This essential extension of the model permits one to calculate the tails of hadron scatterings at low-density final stage.
With the model given, a reasonable description of transverse momentum spectra for several sorts of hadrons and pion HBT radii is achieved for top RHIC energy. The reproduction of recent ALICE LHC femtoscopic results is also presented.

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[4] Iu.A. Karpenko, Yu.M. Sinyukov, Phys.Rev.C 81 (2010), 054903.

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