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Particle spectra and HBT radii for simulated central nuclear collisions of C+C, Al+Al, Cu+Cu, Au+Au, and Pb+Pb from $\sqrt{s} = 62.4 - 2760$ GeV

Tuesday 29 September 2015 16:30 (2 hours)

We study the temperature profile, pion spectra, and HBT radii in central, symmetric, and boost-invariant nuclear collisions, using a super hybrid model for heavy-ion collisions (SONIC), combining pre-equilibrium flow with viscous hydrodynamics and late-stage hadronic rescatterings. In particular, we simulate Pb+Pb collisions at $\sqrt{s} = 2.76$ TeV, Au+Au, Cu+Cu, Al+Al, and C+C collisions at $\sqrt{s} = 200$ GeV, and Au+Au and Cu+Cu collisions at $\sqrt{s} = 62.4$ GeV. We find that SONIC provides a good match to the pion spectra and HBT radii for all collision systems and energies, confirming earlier work that a combination of pre-equilibrium flow, viscosity, and QCD equation of state can resolve the so-called HBT puzzle. For reference, we also show p+p collisions at $\sqrt{s} = 7$ TeV. We make tabulated data for the 2+1 dimensional temperature evolution of all systems publicly available for the use in future jet energy loss or similar studies.

On behalf of collaboration:

NONE

Primary author: HABICH, Mathis (University of Colorado Boulder)

Co-authors: NAGLE, Jamie (University of Colorado Boulder); ROMATSCHKE, Paul (University of Colorado Boulder)

Presenter: HABICH, Mathis (University of Colorado Boulder)

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