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Pre-equilibrium Longitudinal Flow in the IPGlasma Framework for Pb+Pb Collisions at the LHC

Sunday, 25 September 2016 11:20 (20 minutes)

In this talk, we debut a new formulation of IPGlasma and present the first systematic study of the effects of pre-equilibrium longitudinal flow on hadronic and electromagnetic observables in Pb+Pb collisions at 2.76 TeV and 5.02 TeV. The saturation physics based IPGlasma model naturally provides a non-zero initial longitudinal flow through its pre-equilibrium Yang-Mills evolution. Hydrodynamic simulations in (3+1)-dimensions allow us to study the effects of such flow, which deviates from local Bjorken flow and is usually not included in phenomenological studies. Because thermal photons are produced early during heavy-ion collisions, their spectra and flow anisotropy are more sensitive to the early non-zero longitudinal flow. The impact of pre-equilibrium longitudinal flow on direct photon observables is first explored in Pb+Pb collisions at both 2.76 TeV and 5.02 TeV. Effects on the event-by-event distribution of charged hadron v_n , event-plane flow correlations and identified particle observables are quantified, and predictions at 5.02 TeV are highlighted. Finally, the sensitivity of the pre-equilibrium longitudinal flow to the IPGlasma/hydro switching time is discussed.

Summary

Presentation type

Oral

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