Contribution ID: **166** Type: **not specified**

A Novel Approach For Event-By-Event Initial Conditions From Color Glass Condensate

Sunday 25 September 2016 10:40 (20 minutes)

The Color Glass Condensate (CGC) formalism with event-by-event fluctuations in the transverse plane has led to excellent results when coupled to viscous relativistic hydrodynamics. Recently, some of us have suggested analytic and semi-analytic solutions to *event-averaged* quantities in the CGC formalism based on a near field approximation [Phys. Rev. C 92, 064912 (2015)]. This approach gives a rather intuitive and simple picture of the classical gluon fields at the earliest times (tau < 1/Qs). In this talk we start out by reviewing this recent work. We also discuss results from subsequent evolution through viscous fluid dynamics. We then go on to describe how our work can be used to simulate ensembles of gluon field strength tensors and their energy momentum tensors *event-by-event*. Only static 2-D Yang Mills equations have to be solved numerically as the time evolution (up to 1/Qs) is already taken care of by the near field expansion. This promises gains in efficiency.

Summary

We review recent progress made in calculating initial classical gluon fields in nuclear collisions at very early times analytically. We discuss how this can be used to build an event generator.

Presentation type

Oral

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Session Classification: Parallel Session VI: Initial Conditions