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Getting into the Swing of things in Heavy Ion Collisions

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In proton-proton collisions the underlying event is rather well reproduced by general purpose event generators such as Herwig, Pythia and Sherpa. The key to this success has been the modelling of multi-parton interactions (MPI). Since long it has been recognised that the (semi-) soft partonic sub-scatterings in such a scenario cannot be treated completely independent and the concept of “colour reconnections” was introduced, where the hadronising strings in an event may be spanning partons from several different sub scatterings.

The Angantyr model for generating fully hadronic exclusive final states in heavy ion collisions in Pythia8 originally did not include any collective effects. Rather it simply stacked a number nucleon-nucleon collisions from Pythia on top of each other, without allowing any crosstalk. Nevertheless Angantyr is able to reproduce fairly well general features of events in pA and AA, such as multiplicity and transverse momentum distributions of charged particles.

In this talk I will present the so-called Swing model for colour reconnections, which originally was developed for the Ariadne/DIPSY program. Contrary to the standard reconnection models (eg. the ones implemented for pp in Pythia), the swing is applied already on the perturbative level and will also affect jet evolution. This model is now being implemented in the Pythia8/Angantyr program where it allows for colour reconnections between partons from different nucleon-nucleon sub-collisions in pA and AA. This requires a proper treatment of the space-time structure of heavy ion collisions in general, and in particular of the jet evolution in such events. I will present preliminary preliminary results from this model with emphasis on jet-related observables.

Collaboration (if applicable)

Track

Jets and High Momentum Hadrons

Contribution type

Contributed Talk

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