Contribution ID: **62** Type: **not specified**

Multiplicity fluctuations and flow at the quark-hadron phase transition in a fluid dynamical model

Monday, 22 September 2014 17:00 (30 minutes)

The region of large net-baryon densities in the QCD phase diagram is expected to exhibit a first-order phase transition. Experimentally, its study will be one of the primary objectives for the upcoming FAIR accelerator. We model the transition between quarks and hadrons in a heavy-ion collision using a fluid which is coupled to the explicit dynamics of the chiral order parameter. This allows us to investigate signals stemming from the nonequilibrium evolution during the expansion of the hot plasma. Special emphasis is put on the buildup of flow as a result of spinodal decomposition at the first-order phase transition in comparison to a crossover or a critical point. Moreover, we present an event-by-event analysis of baryon number fluctuations which have long since been claimed to be sensitive to a critical point.

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Session Classification: Talks