
Contribution ID: **44** Type: **not specified**

# Signals for the QCD phase transition and critical point in a Langevin dynamical model

*Tuesday, 4 September 2012 10:00 (30 minutes)*

The search for the critical point is one of the central issues that will be investigated in the upcoming FAIR project. For a profound theoretical understanding of the expected signals we go beyond thermodynamic studies and present a fully dynamical model for the chiral and deconfinement phase transition in heavy ion collisions. The corresponding order parameters are propagated by Langevin equations of motions on a thermal background provided by a fluid dynamically expanding plasma of quarks. By that we are able to describe nonequilibrium effects occurring during the rapid expansion of a hot fireball.
We observe several critical phenomena like the enhancement of long wavelength fluctuations and critical slowing down near the endpoint of the first order transition line. For an evolution through the phase transition the formation of a supercooled phase and its subsequent decay lead to a significant reheating of the quark medium. We find an enhancement of density fluctuations along the first order phase transition line within single events. Furthermore, we provide a study of event-by-event fluctuations of several observables like the average chiral condensate or the baryon number.

**Primary author:** HEROLD, Christoph (FIAS)

**Presenter:** HEROLD, Christoph (FIAS)

**Session Classification:** Talks