



Contribution ID: 98

Type: **Contributed Talk**

## Onset of mesonic condensation phenomena from higher order susceptibilities

*Thursday, 30 June 2016 09:40 (20 minutes)*

In this talk we discuss possibilities of studying the onset of Bose-Einstein condensation in strangeness and isospin sector of QCD. At finite temperature, the condensation of kaons (pions) may occur if the strangeness (isospin) chemical potential is large enough and the temperature is sufficiently small for the relevant mesonic degrees of freedom to be present. Direct lattice QCD study of kaon condensate phase (at a non-zero  $\mu_s$ ) is hindered by the sign problem. The lattice QCD studies of the pion condensation are in principal possible, but have not yet been performed for realistic QCD. High energy heavy-ion collision experiments also cannot directly probe the condensation phenomena, because the corresponding chemical potentials achieved are too small. In this talk we propose to probe the condensation phenomena using the higher order fluctuations of the corresponding charges. First the general analytic structure of the QCD phase diagram will be reviewed. Next, using the hadron resonance gas model, as well as Functional renormalization group improve quark meson model we will demonstrate what can be learned about the condensation onset. We also discuss possibilities of probing the phase boundaries of these condensate phases in high energy heavy-ion experiments using higher order kaon and pion fluctuations.

**Primary authors:** MUKHERJEE, Swagato (Brookhaven National Laboratory); SKOKOV, Vladimir (Brookhaven national laboratory)

**Presenter:** SKOKOV, Vladimir (Brookhaven national laboratory)

**Session Classification:** Strangeness in Astrophysics