Heavy Ion Forum

SPEAKER: Michael Tannenbaum (Brookhaven National Laboratory)

TITLE: **Phenix Measurements of Et distributions in p-p, d+Au and Au+Au at √sNN=200 GeV and analysis based on Constituent-Quark-Participants**

DATE: Thu 12/12/2013 10:00

PLACE: TH Conference Room

ABSTRACT

Measurements of mid-rapidity dET/dn distributions in p+p, d+Au and Au+Au at √sNN =200 GeV by PHENIX at RHIC are presented and analyzed in terms of the number of Constituent-Quark participants, Nqp. This provides a physical way to introduce fluctuations in Glauber Model calculations of p+p collisions, since the spatial distribution of each of the three constituent quarks in a nucleon is generated according to the measured charge distribution of the proton. It had been noted previously that dNch=d at mid-rapidity in Au+Au collisions at √sNN=200 GeV as a function of centrality is not simply proportional to the number of nucleon participants, Npart, (the Wounded Nucleon Model, WNM) but is linearly proportional to the number of constituent-quark participants, Nqp, (the NQP model). For symmetric systems, the NQP model is identical to the Additive Quark Model (AQM) used in the 1980's, to explain a similar disagreement of dET =d distributions with the Wounded Nucleon Model in α-α relative to p-p collisions at √sNN =31 GeV at the CERN-ISR. However, the AQM and NQP models differ for the case of asymmetric systems such as d+Au, where the AQM, which is a color-string model, is effectively proportional only to the number quark-participants in the projectile. The present d+Au data clearly reject the AQM model in favor of the NQP, which is also in excellent agreement with the Au+Au data. The NQP model also explains why the additional contribution proportional the number of binary-collisions, Ncoll, added to Npart to parametrize the centralitydependence of A+A collisions works, but does not imply a hard-scattering component in ET distributions and thus is no longer in disagreement with lessons learned from measurements of ET distributions in p+p(p) collisions at the CERN SpS, ISR and SpS-Collider.

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