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Multiplicity and pseudo-rapidity distributions of photons at forward rapidity in STAR at RHIC energies

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The main goal of the STAR experiment at Relativistic Heavy Ion Collider (RHIC) is to study the properties of the QCD matter at extremely high energy density and parton density, created in the heavy ion collisions. Photons are produced at all stages of the colliding system and through decay of produced particles like neutral pions. The multiplicity measurement of photons on an event-by-event basis is an important measurement complementing the charged particle measurement in a heavy ion collision. Inclusive photon production at forward rapidity shows an energy-independent longitudinal scaling as observed at $\sqrt{s_{NN}} = 62.4$ and 200 GeV [1,2]. Photons measurements at lower energies will be helpful in further testing the energy dependence of the longitudinal scaling.

The Photon Multiplicity Detector in the STAR experiment measures inclusive photons in the pseudo-rapidity region $-3.7 < \eta < -2.3$. We will present the multiplicity and pseudo-rapidity distributions of photons in Au+Au collisions at $\sqrt{s_{NN}} = 39$ and 19.6 GeV for different event centralities. These measurements will be compared with published results at $\sqrt{s_{NN}} = 200$ and 62.4 GeV and with models.

References

- [1] Bedangadas Mohanty, J.Phys.Conf.Ser.50:(2006) 319
- [2] STAR Collaboration, Nucl.Phys.A 832(2009) 134

Author: Ms SOLANKI, Dronika (University of rajasthan)

Presenter: Ms SOLANKI, Dronika (University of rajasthan)

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