ϕ- Meson Production at RHIC Energies using the PHENIX Detector

Deepali Sharma for the PHENIX Collaboration[a]

[a]The Weizmann Institute of Science
deepali.sharma@weizmann.ac.il

Light vector mesons are among the most informative probes to understand the strongly coupled Quark Gluon Plasma created at RHIC. The suppression of light mesons at high transverse momentum, compared to expectations from scaled $p+p$ results, reflects the properties of the strongly interacting matter formed. The ϕ-meson is one of the probes whose systematic measurement in $p+p$, $d+Au$, $Cu+Cu$ and $Au+Au$ collisions can provide useful information about the initial and final state effects in particle production. The mass, width and branching ratio of the ϕ-meson decay in the dikaon and dielectron decay channels could be modified due to the restoration of chiral symmetry in the QGP.
In addition, the ϕ-meson is the lightest vector meson with hidden strangeness and hence its measurement is important in understanding the strangeness production in nucleon-nucleon and nuclei-nuclei collisions. Finally, the similar mass of the ϕ-meson and the proton will also help to understand the baryon/meson anomaly in hadron production at intermediate p_T (2 GeV/c $< p_T <$ 5 GeV/c). The PHENIX experiment has measured the ϕ-meson production in various systems ranging form $p+p$, $d+Au$, $Cu+Cu$ to $Au+Au$ collisions via both its dielectron and dikaon decay modes. In this talk, I will present the recent PHENIX results on invariant spectra, nuclear modification factor R_{AA} and elliptic flow of the ϕ-meson.