Contribution ID: **128** Type: **Oral presentation**

# Neutral pion production in Au+Au collisions at RHIC

*Monday, 28 May 2012 16:50 (20 minutes)*

Neutral pion production in \sqrt{sNN}=130 and 200 GeV central Au+Au collisions at the Relativistic Heavy Ion Collider has been found to be strongly suppressed in comparison to the expectations from properly scaled p+p collisions [1], while data from d+Au collisions showed no suppression [2]. This observation was one of the first convincing signatures of a strongly interacting partonic medium created in high energy heavy ion collisions.

A study of the azimuthal anisotropy of pi0 production in the RHIC \sqrt{sNN}=200 GeV Au+Au data from 2004 indicated that the azimuthal dependence of the nuclear modification factor R_AA is strongly correlated with the (approximately elliptical) geometry of the overlap region up to pT=10 GeV/c [3]. The approximately 4 times higher integrated luminosity of 2007 Au+Au collision data, together with a reaction plane detector upgrade, allowed for a significantly improved determination of the dependence of R_AA on the reaction plane up to pT=18 GeV/c. Recent results on the azimuthal anisotropy of pi0 production will be shown and compared to several theoretical models.

A 2005 RHIC energy scan with Cu+Cu collisions pointed out that pi0 suppression still exists in this lighter system at 62.4 GeV, while the 22.4 GeV Cu+Cu results showed an enhancement consistent with theoretical predictions [4]. Onset and evolution of the in-medium suppression with collision energy, centrality and system size will be presented, including the new results from Au+Au data collected in 2010 at \sqrt{sNN}=39 and 62.4 GeV c.m.s. energies.

[1] K. Adcox et al., Phys. Rev. Lett. 88, 022301 (2002);
S. S. Adler et al., Phys. Rev. Lett. 91, 072301 (2003).
[2] S. S. Adler et al., Phys. Rev. Lett. 91, 072303 (2003).
[3] S. Afanasiev et al., Phys. Rev. C 80, 054907 (2009).
[4] A. Adare et al., Phys. Rev. Lett. 101, 162301 (2008).

**Primary author:** VERTESI, Robert (Institute for Particle and Nuclear Physics, Wigner RCP, HAS)

**Presenter:** VERTESI, Robert (Institute for Particle and Nuclear Physics, Wigner RCP, HAS)

**Session Classification:** Parallel IIC: High pT suppression, Global Observables