

Abstract Submitted  
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**Neutral pion production with respect to the reaction plane in  $\sqrt{s_{NN}} = 200$  GeV Au+Au collisions at PHENIX** YOKI ARAMAKI, CNS, University of Tokyo, PHENIX COLLABORATION — It has been observed that the yield of neutral pion at high transverse momentum ( $p_T > 6$  GeV/ $c$ ) region is strongly suppressed in central Au+Au collisions at Relativistic Heavy Ion Collider (RHIC), compared to the one expected from  $p + p$  collisions. This suppression is interpreted as a consequence of an energy loss of hard scattered partons in the medium (jet quenching), which results in a decrease of the yield at a given  $p_T$ . Many calculations of parton energy loss predict the quantity of energy loss is proportional to square of the path length. Therefore measuring the quantity of the energy loss for each path length will be able to strongly constrain these calculations. A new reaction plane detector was installed in the PHENIX detector in RHIC 2007 run, and the reaction plane can be determined about 2 times better than before. Furthermore the integrated luminosity in RHIC 2007 run achieved  $813 \mu b^{-1}$  and this is about 4 times larger than the previous run. With these improvements both the nuclear modification factor as a function of reaction plane can be measured and the respective average pathlength estimated with about a factor of 4 smaller errors than in the published RHIC 2004 data [1].

[1] PHENIX Collaboration: A Adare, *et al.* arXiv:0903.4886v1

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