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Thermal photon production in Au+Au collisions observed by PHENIX

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Direct photons provide valuable insight into the collective properties of Quark-Gluon Plasma. They are emitted throughout the evolution of a heavy ion collision and do not interact strongly with the medium as they leave it. The PHENIX experiment has detected both a large yield and a large elliptic flow of low- p_T direct photons in Au+Au collisions at $\sqrt{s_{NN}} = 200$ GeV. Calculation of thermal photon emission fall short in describing the yield and the anisotropy at the same time. An intriguing scaling behavior is observed between the low- p_T direct photon production and the charge particle multiplicity across all p(d)+A and A+A collision systems and different beam energies from 39 GeV to 2760 GeV, indicating similar photon sources for all these systems. To provide more insight into photon production mechanism and more constraints on theoretical models, precise measurement of the direct photon anisotropy is needed. In this talk, measurements of spectra and the flow coefficients of low-momentum will be presented with the high statistics of Au+Au data taken in the year 2014. New results provide a 10 fold increase in statistics for the measurement of direct photon yields and their anisotropy.

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