First measurement of the J/ψ elliptic flow parameter v_2 in Au+Au collisions at $\sqrt{s_{\rm NN}} = 200$ GeV by the PHENIX experiment

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Recent results indicate that the J/ψ suppression pattern differs with rapidity showing a larger suppression at forward rapidity. J/ψ suppression mechanisms based on energy density (such as color screening, interaction with co-movers, etc.) predict the opposite trend. On the other hand, it is expected that more c-$\bar{c}$ pairs should be available to form quarkonia at mid-rapidity via recombination. Even though available models fail to reproduce simultaneously all J/ψ data and lack of experimental inputs such as cold-nuclear matter effects, open charm cross-section or feed-down ratio, they provide a way to differentiate J/ψ production from initially produced c-$\bar{c}$ pairs and final state recombination of uncorrelated pairs, via the rapidity and transverse momentum dependence of the elliptic flow (v_2). Measuring the J/ψ v_2 would allow to quantify the collective behavior of the J/ψ meson and its precursors and better constrain the space-time evolution of heavy-particles in the matter.
During 2007 data taking at RHIC, a large sample of Au+Au collisions at $\sqrt{s_{NN}}$=200 GeV was collected. The statistics has been highly increased compared to previous data set from 2004, thus allowing a more precise measurement of the J/ψ meson at both mid and forward rapidity. Furthermore, the PHENIX experiment benefited from the addition of a new detector, which improves the reaction plane resolution and allows us to measure the J/psi elliptic flow parameter v_2. Comparing this measurement to the positive v_2 measured for D-mesons (coming from non-photonic electrons) will help constrain the J/ψ production mechanisms and get a more precise picture on the proportion of J/ψ coming from direct production or charm quark coalescence.
Details on how the J/ψ v_2 is measured at both rapidities will be presented. The J/ψ v_2 as a function of transverse momentum will be compared to existing models.