Global spin alignment of ϕ and K^{*0} vector mesons in Au+Au collisions from RHIC BES-II program

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Abstract

Global spin alignment is a preferential alignment of a particle's spin along the orbital angular momentum produced in heavy-ion collisions. The global spin alignment of vector mesons ($J^P = 1^-$) ϕ and K^{*0} may be sensitive to the vorticity and hadronization mechanism in the medium. The second phase of RHIC Beam Energy Scan (BES-II) program provides new and higher statistics data sets for Au+Au collisions at $\sqrt{s_{\rm NN}}$ = 7.7-19.6 GeV. From this data, we can make high precision measurements of ϕ and K^{*0} global spin alignment, allowing for more differential studies not possible with the BES-I data. We can also compare global spin alignment between ϕ and K^{*0}, where the lifetime of ϕ is roughly ten times larger than that of K^{*0} and the latter is more sensitive to hadronic re-scattering. In this talk, we report high precision measurements for the global spin alignment of ϕ and K^{*0} at $\sqrt{s_{\rm NN}}$ = 14.6 and 19.6 GeV from BES-II.