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Open charmed hadron production in p+p, Au+Au and U+U collisions at STAR

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Heavy quarks are dominantly produced from initial hard scatterings in high-energy heavy ion collisions, and their interaction with QCD medium is sensitive to the medium dynamics. Thus heavy quarks are suggested as excellent probes to study the properties of the hot and dense nuclear matter created at the Relativistic Heavy Ion Collider. In this talk, we present the first results of open charm meson production in U+U collisions at $\sqrt{s_{NN}}=193$ GeV from the STAR experiment. We also report on updated results in Au+Au collisions at $\sqrt{s_{NN}}=200$ GeV, and those in p+p collisions at $\sqrt{s}=200$ GeV and 500 GeV. In these measurements, D^0 and D^* mesons are reconstructed through hadronic decay channels. For both U+U and Au+Au collisions, invariant D^0 meson production yields are determined from minbias and 0-10% central triggered events for the p_T range from 0 to 6 GeV/c. For p+p collisions, events with high E_T triggers are used to extend the p_T range of the measured cross section up to 10 GeV/c at $\sqrt{s}=200$ GeV and to 18 GeV/c at $\sqrt{s}=500$ GeV, respectively. Nuclear modification factors (R_{AA}) of open charm mesons are extracted from these results and are compared to various theoretical model calculations.

On behalf of collaboration:

STAR

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