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Title: Charmonium Production in p -A and A-A Collisions
what we have learned from the
RHIC d+Au program

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what we have learned from the RHIC d+Au program

Measurements in p+A, and at RHIC in d+Au collisions have long been a fundamental arena for the study of the modification of QCD processes in normal or cold nuclear matter (CNM). They provide insight into fundamental physics such as coherence effects or shadowing in nuclei, the saturation of gluons at small momentum, the energy loss of quarks or gluons in CNM, and soft multiple scattering effects that cause broadening of the transverse momentum. For heavy-ion physics it has been apparent for some time that CNM effects must be quantified before physics beyond these can be inferred from the heavy-ion results. Most notably at RHIC, the large densities of the hot-dense matter created in heavy-ion collisions indicated by the suppression of pions at high transverse momentum, could not be substantiated until it was verified that no such effects occurred in d+Au collisions. We will review the progress at RHIC in quantifying CNM effects in various sectors including high-pT particle suppression and correlations, direct photon production, particle production at forward rapidity and small x, and open and closed heavy-quark systems - in the context of related measurements at Fermilab and CERN.