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Quarkonia measurements and physics opportunities in $p+A$ collisions at the PHENIX experiment. KWANGBOK LEE, Los Alamos National Laboratory, PHENIX COLLABORATION — The PHENIX collaboration has measured quarkonia resonances of J/ψ , ψ' , χ_c and Υ in $d+Au$ collisions. The measurements give us important knowledge to understand the cold nuclear matter effects of nuclear parton modification, gluon saturation, initial state parton energy loss and final state nuclear absorption models. In addition to the quarkonia, measurements of the Drell-Yan process are also good channels to understand the initial-state effects since the leptons from Drell-Yan will not interact with the nuclear medium. Recently installed Silicon Vertex Detectors, FVTX & VTX, will measure open heavy flavors and Drell-Yan precisely. At RHIC, there are discussions to deliver multi-species $p+A$ collisions to get new and interesting physics measurements in near future. In this talk, I review the PHENIX measurements and discuss the physics opportunities with $p+A$ collisions by the FVTX & VTX detectors and with possible detector upgrades for the future.

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