

Abstract Submitted  
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**Hard QCD rescattering in few nucleon systems**<sup>1</sup> DHIRAJ MAHESWARI, MISAK SARGSIAN, Florida Intl Univ — The theoretical framework of hard QCD rescattering mechanism (HRM) is extended to calculate the high energy  $\gamma^3He \rightarrow pd$  reaction at  $90^\circ$  center of mass angle. In HRM model, the incoming high energy photon strikes a quark from one of the nucleons in the target which subsequently undergoes hard rescattering with the quarks from the other nucleons generating hard two-body baryonic system in the final state of the reaction. Based on the HRM, a parameter free expression for the differential cross section for the reaction is derived, expressed through the  $^3He \rightarrow pd$  transition spectral function, hard  $pd \rightarrow pd$  elastic scattering cross section and the effective charge of the quarks being interchanged in the hard rescattering process. The numerical estimates obtained from this expression for the differential cross section are in a good agreement with the data recently obtained at the Jefferson Lab experiment, showing the energy scaling of cross section with an exponent of  $s^{-1.7}$ , also consistent with the quark counting rule. The angular and energy dependences of the cross section are also predicted within HRM which are in good agreement with the preliminary data of these distributions.

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