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Level structure of ^{96}Mo from the (d,pγ) measurement with ^{95}Mo beams and GODDESS[1] H. GARLAND, A. LEPAILLEUR, J.A. CIZEWSKI, H. SIMS, G. SEYMOUR, C.C. UMMEL, Rutgers, S.D. PAIN, ORNL, A. RATKIEWICZ, LLNL, GODDESS COLLABORATION — When used in conjunction with radioactive ion beams in inverse kinematics, the surrogate reactions method (SRM) can inform neutron capture cross sections on isotopes of interest to the r process. The use of SRM requires a modern nuclear reaction model of the (d,p) reaction that includes deuteron break-up and a level scheme that is as detailed as possible. Recently, the (d, p) reaction was confirmed as a surrogate for (n, γ) reactions in normal kinematics using a ^{95}Mo target.[1] To extend the benchmarking of the surrogate reactions method to inverse kinematics, a (d, pγ) measurement with ^{95}Mo beams was performed using GODDESS (Gammasphere ORRUBA: Dual Detectors for Experimental Structure Studies) at ATLAS. This GODDESS experiment is the first (d, pγ) measurement on ^{95}Mo to populate two-neutron configurations of states below 4 MeV. This (d, pγ) study is an important step in refining the reaction theory and current level scheme of ^{96}Mo for use in the surrogate reaction analysis. Preliminary results detailing the differential cross sections of low-lying states in ^{96}Mo and extension of the ^{96}Mo level scheme will be presented. [1] A. Ratkiewicz et al, Phys. Rev. Let., **122** 052502 (2019).

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