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Particle-Gamma Studies of Transitional Gd Nuclei Via Light-Ion Reactions R.O. HUGHES, T.J. ROSS, C.W. BEAUSANG, University of Richmond, J.M. ALLMOND, J.T. BURKE, L. PHAIR, C.T. ANGELL, M.S. BASUNIA, D.L. BLEUEL, R.J. CASPERSON, P. FALLON, R. HATARIK, J. MUNSON, S. PASCHALIS, M. PETRI, J.J. RESSLER, N.D. SCIELZO, STARS-LIBERACE Collaboration — Gd nuclei with N $\sim$ 90 are of great interest due to a rapid change from vibrational to rotational character. Numerous experiments that have studied these nuclei were limited to either pure γ-ray or pure charged-particle studies. Recently, a series of experiments have been carried out at the 88-Inch cyclotron at LBNL, which combine relatively high-efficiency γ-ray and charged-particle spectroscopy in the same experiment. A beam of 25 MeV protons was incident on enriched ^{154}Gd, ^{155}Gd, ^{156}Gd and ^{158}Gd targets. Charged particles from the (p,p'), (p,d), and (p,t) reaction channels were detected using a Si-telescope array (STARS) and the coincident gamma-rays (in $^{152-158}$Gd) were detected using the Liberace HPGe clover array. The relatively high particle-gamma efficiency, precise energy resolution (via the γ rays), and particle-γ angular information provides a precision tool for spectroscopic studies. Preliminary results will be presented. This work was supported in part by the DOE under grant Nos. DE-FG02-05 ER41379 & DE-FG52-06 NA26206 (UR), DE-AC52 07NA27344 (LLNL), DE-AC02 05CH11231 (LBNL).

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