

Abstract Submitted  
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**Study of  $^{155}\text{Gd}$  by the  $(\text{p},\text{d}\gamma)$  Reaction<sup>1</sup>** J.M. ALLMOND, C.W. BEAUSANG, T.J. ROSS, B.K. DARAKCHIEVA, Department of Physics, University of Richmond, Virginia 23173, STARS-LIBERACE COLLABORATION — The structure of the  $N = 90$  and neighboring nuclei have been of recent interest due to an unusual number of low-lying  $0^+$  states and a rapid change from vibrational to rotational character. The single, unpaired neutron in  $^{155}\text{Gd}$  ( $N = 91$ ) acts as a probe to the  $^{154}\text{Gd}$  ( $N = 90$ ) core. To study this, an experiment was conducted at the 88-Inch Cyclotron at LBNL using the STARS and LiBerACE detector arrays. A 25 MeV proton beam incident onto a  $^{156}\text{Gd}$  target was used to populate states in  $^{155}\text{Gd}$  by the  $(\text{p},\text{d}\gamma)$  reaction. The exit channel of the reaction and the residual excitation energy of the nucleus were tagged by detecting scattered charged particles in a Si telescope array (STARS) while coincident gamma rays were detected using 6 Ge clovers and 1 Ge LEPS detector of the LiBerACE array. Particle- $\gamma$  and particle- $\gamma$ - $\gamma$  correlations are used to probe the structure of  $^{155}\text{Gd}$ . Preliminary results are presented.

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