

Abstract Submitted  
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**Study of low-spin states in  $^{154}\text{Gd}$  via the  $(p, p'\gamma)$  reaction** BAHARAK HADINIA, PAUL GARRETT, LAURA BIANCO, VINZENZ BILDSTEIN, GREG DEMAND, ALEJANDRA DIAZ-VARELA, University of Guelph, Canada, TUOMAS GRAHN, University of Jyväskylä, Finland, MARC LABICHE, Daresbury Laboratory, UK, ALEX LOFFOLEY, University of Guelph, Canada, ROBERT PAGE, EDWARD PARR, University of Liverpool, UK, EVAN RAND, University of Guelph, Canada, JOHN REVILL, University of Liverpool, UK, CARL SVENSSON, JAMES WONG, University of Guelph, Canada, UNIVERSITY OF GUELPH, CANADA TEAM, UNIVERSITY OF JYVÄSKYLÄ, FINLAND TEAM<sup>1</sup>, DARESBURY LABORATORY, UK COLLABORATION, UNIVERSITY OF LIVERPOOL, UK COLLABORATION — Located in a region where nuclear shapes change rapidly, nuclei at  $N = 90$  have long been a challenge for nuclear structure models. Competing ideas involve shape coexistence, a critical point of a shape phase transition, and tetrahedral symmetries. For example, it has been predicted that  $^{154}\text{Gd}$  is a tetrahedral double-magic nucleus. Despite previous studies of  $^{154}\text{Gd}$ , there remains no definite explanation for its structure. Much discriminatory information between nuclear models comes from low-spin non-yrast states, so probing states below the pairing gap and their properties may lead to a clearer interpretation of the structure of  $^{154}\text{Gd}$ . An ideal reaction to achieve this is the  $(p, p'\gamma)$  reaction. We performed the  $^{154}\text{Gd}(p, p'\gamma)$  reaction at the laboratory of the University of Jyväskylä using 12 MeV protons and the JUROGAM II and LISA spectrometers. Preliminary results and analysis will be presented.

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