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Utilizing angular distributions to measure the spin imparted to the continuum region of Gd nuclei by light-ion transfer reactions¹ T.J. ROSS, C.W. BEAUSANG, R.O. HUGHES, University of Richmond, J.M. ALLMOND, C.T. ANGELL, M.S. BASUNIA, D.L. BLEUEL, J.T. BURKE, R.J. CASPERSON, J.E. ESCHER, P. FALLON, R. HATARIK, J. MUNSON, S. PASCHALIS, M. PETRI, L. PHAIR, J.J. RESSLER, N.D. SCIELZO, I.J. THOMP-SON, STARS-LIBERACE Collaboration — Historically it has proven extremely difficult to probe the properties of low-spin highly-excited states far above the yrast line in the bound quasi-continuum. We present the first measurement of the initial spin distribution of this region, following (p,d) and (p,t) reactions on ¹⁵⁴Gd and ¹⁵⁸Gd targets. The 25 MeV proton beam was provided by the 88-Inch Cyclotron at Lawrence Berkeley National Laboratory. A silicon telescope array, STARS, was used to detect light ions. We find that the spin transferred increases with excitation energy. Between 3 and 8 MeV, assuming a single dominant angular momentum transfer component, the measured angular distribution for the (p,d) reactions are well reproduced by DWBA calculations for $\Delta L=4\hbar$ transfer, whilst the (p,t) reactions are better characterized by $\Delta L=5\hbar$. A weighted combination of DWBA calculations, agrees excellently with experimental angular distributions.

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