

LIGHT-ION REACTIONS

EXCITATION OF THE GIANT RESONANCES IN  $^{58}\text{Ni}$ ,  $^{90}\text{Zr}$ ,  $^{116}\text{Sn}$  AND  $^{208}\text{Pb}$  BY INELASTIC HELION SCATTERING AT 270 MeV

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The excitation of giant resonances in  $^{58}\text{Ni}$ ,  $^{90}\text{Zr}$ ,  $^{116}\text{Sn}$  and  $^{208}\text{Pb}$  has been studied by the inelastic scattering of 270 MeV helions obtained from the Indiana University Cyclotron Facility. The main motivation for the present work has been not only to confirm the

existence of already established resonances like the giant quadrupole resonance but also to look for the presence of higher multipole resonances with  $L > 2$  which, if present, are expected to be excited relatively more strongly at higher bombarding energies.

The helions were detected by a telescope consisting of intrinsic Ge detectors. Measurements were made over an angular range of  $8^\circ$  to  $21^\circ$ . The telescope covered an excitation energy range from 0 to 40 MeV. In general it is found that the ratio of the giant resonance peak height to the continuum background is considerably larger than that found at lower bombarding energies. This feature should lead to a better determination of the giant resonance strengths.

Some progress has been made in the analysis of the giant resonance region in  $^{58}\text{Ni}$ . The spectra obtained at  $\sim 10^\circ$  and  $18^\circ$  are shown in the figure (Fig. 1). The preliminary results are reported in Ref. 1. Analysis of rest of the data is in progress.

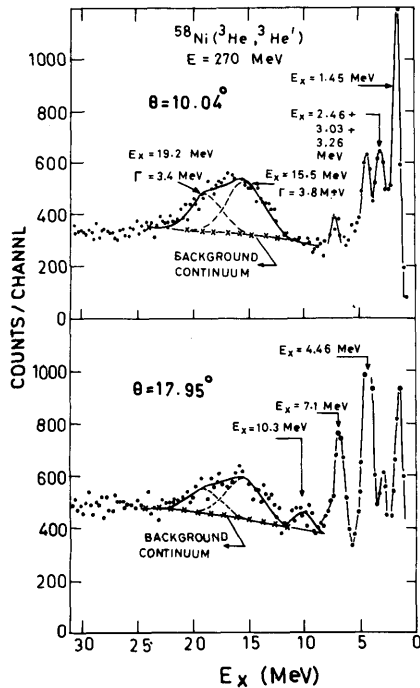


Figure 1. Angular distributions measured for inelastic scattering of  $^3\text{He}$  ions to low-lying states in  $^{58}\text{Ni}$ . The solid curves are DWBA calculations.

1) S. Kailas, A. Saxena, M.L. Sehgal, P.P. Singh, P. Schwandt, E.J. Stephenson, D.L. Friesel, Q. Chen, Symposium on Nuclear Physics, Jaipur, India 28B 64 (1985).