Although some progress[2] has been made in the inclusion of a g-boson (using the code of P. Van Isacker),[3] there are more parameters than data points when only ^{192}Os data are studied. It is hoped that our ^{194,198}Pt data will sufficiently expand the data base to permit a more definitive examination of the model.

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3) P. Van Isacker, private communication.

MULTIPOLE MOMENTS OF ^{176}Yb and ^{182}W FROM INELASTIC SCATTERING OF 134 MEV PROTONS

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We have completed the coupled-channels analysis of the cross sections and asymmetries for ground state rotational band members up to $J^\pi=6^+$ in ^{176}Yb and ^{182}W, excited in $(\vec{p},p')$ reactions at 134 MeV. One goal in this and in our similar study[1] of ^{154}Sm and ^{166}Er using the same reaction is to deduce the multipole moments of the matter distributions of these nuclei.

The measurements, typical spectra, and preliminary results were presented in last year's annual report. The final fits to these data are shown in Figs. 1 and 2. Using a theorem due to Satchler[2] the normalized multipole moments of the deformed optical model potential used to fit the data should be equal to the multipole moments of the matter distribution. This assumes that the potential is derivable from folding a central, scalar, energy- and density-independent interaction with the matter density. The multipole moments of the real part of the deformed optical model were calculated using the parameters from the final fits. These moments are given in Table 1.

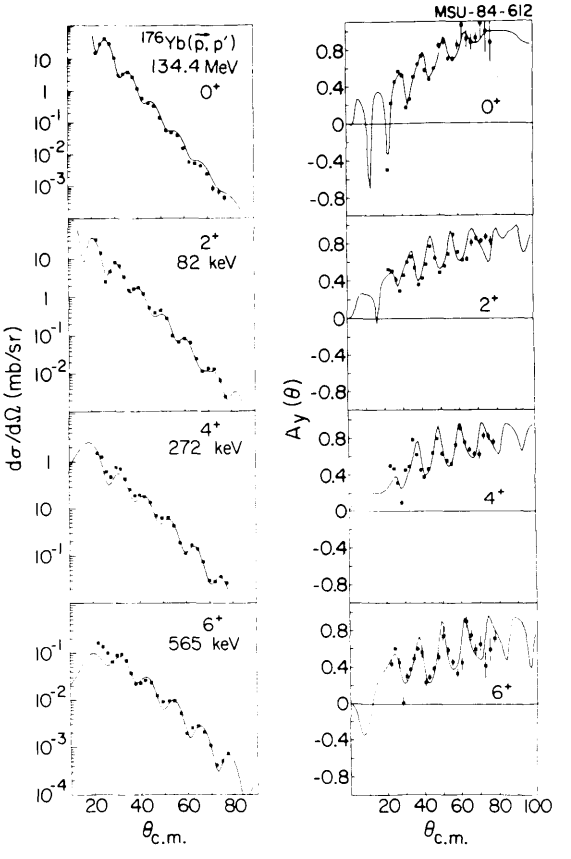

Figure 1. Data and coupled channel fits for differential cross sections and analyzing powers for excitation of ground state rotational band states to $J^\pi=6^+$ in ^{176}Yb.

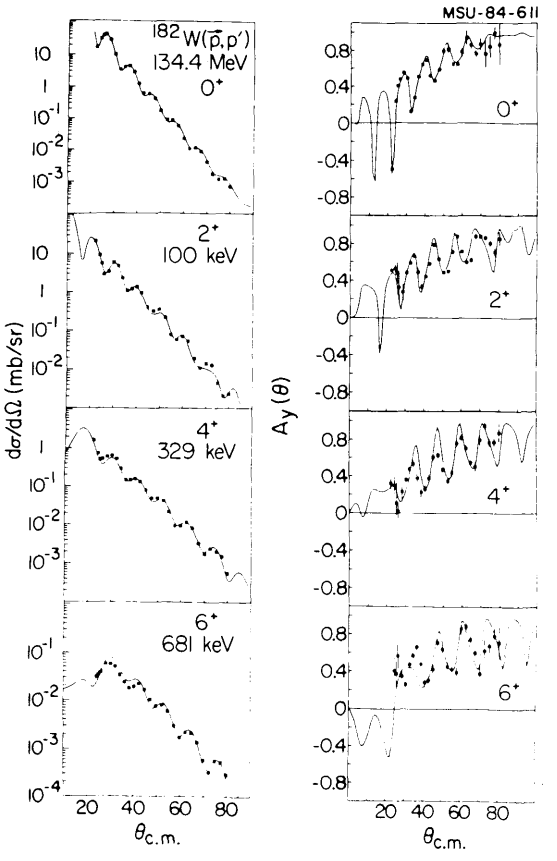

Figure 2. Data and coupled channel fits for differential cross sections and analyzing powers for excitation of ground state rotational band states to $J^{\pi}=6^{+}$ in ^{182}W.

Table 1. Multipole moments for ^{176}Yb and ^{182}W

Nucleus	q_{20} (eb)	q_{40} (eb^2)	q_{60} (eb^3)
^{176}Yb	2.31 (6)	-0.052 (44)	-0.054 (24)
^{182}W	2.03 (6)	-0.25 $\binom{13}{33}$	-0.068 $\binom{6}{14}$

The hexacontatetrapole deformation parameters from the present study, our previous study, and those from (α,α') and (p,p') reactions[3,4,5] at other energies are shown in Fig. 3. Also shown are theoretical calculations by Nilsson et al.[1] If our result for ^{154}Sm is correct the theoretically expected trend is verified for the first time.

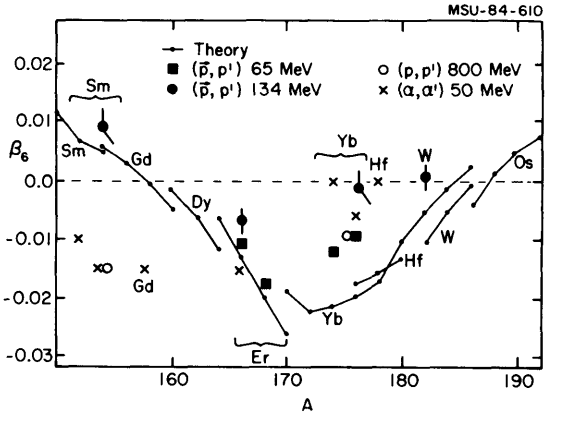

Figure 3. Hexacontaterapole deformation parameters in the rare earth region. The data for (α,α') and (p,p') reactions at 50, 65, 134, and 800 MeV are from Ref. 1,3,4, and 5 respectively. The theoretical calculations are by Nilsson et al.[1]

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