degrees than the calculations despite the inclusion of exact finite range and the deuteron D state.

The effects of two step processes in the transition to the 4.44 MeV state have been investigated as was the use of a bound state geometry obtained from elastic scattering form factors but the results were not significantly different from those using single step transfers or a standard bound state geometry.

A paper summarizing these results in more detail has been prepared but the inability to achieve good fits to the data is unaccounted for at present.

†Present address: Physics Department, Princeton University, Princeton, NJ 08544

1) C.C. Foster et al., IUCF Scientific and Technical Report 1982, p. 128.

2) P.B. Foot et al., Phys. Rev. C, in press.

3) R.C. Johnson and P.J.R. Soper, Phys. Rev. C 1, 976 (1970).

(d,n) REACTION STUDIES AT 80 MeV

C.C. Foster, D.L. Friesel, H. Nann, and E.J. Stephenson
Indiana University Cyclotron Facility, Bloomington, Indiana 47405

B.D. Anderson, A.R. Baldwin, B.S. Flanders, C. Lebo, R. Madey, W. Pairsuwan, and J.W. Watson
Kent State University, Kent, Ohio 44242

P.B. Foot, V.C. Officer, G.G. Shute, and B.M. Spicer
University of Melbourne, Parkville, Victoria, Australia 3052

Spectroscipic factors have been extracted for the 0.0, 1.78, 4.61, 4.97, and 6.28 MeV states excited by the $^{27}Al(d,n)^{28}Si$ reaction at 78.9 MeV incident deuteron energy. Adiabatic calculations using the method of Johnson and Soper[1] have been found to fit the cross section angular distributions well and better than standard DWUCK4[2] calculations[3]. In addition, it has been possible to determine the spectroscopic factors for the 6^-, T=0 state at 11.57 MeV and the 6^-, T=1 state at 14.36 MeV from this data with about 20 percent uncertainties. A few details must be clarified before this work, which is in preprint form, is ready for publication.

Vector analyzing powers for the $^{48}Ca(d,n)^{49}Sc$ reaction at 78.7 MeV have been measured to complement the cross section data measured previously.[1] Analysis of the full set of data has been carried out in terms of DWBA and Johnson-Soper adiabatic approximation (JSAA) calculations. The JSAA calculations generally provided a better description of the data, with reasonable absolute spectroscopic factors. An upper limit (<5%) to the amount of proton two-particle-two-hole ground state correlations is obtained from the cross sections for the unresolved doublet of positive parity states near 2.3 MeV of excitation. This work is in preprint form.

The quality of agreement between the calculated and measured vector analyzing power angular distributions is not very good for the dominant $7/2^-$ ground state excitation although the general trend of the data is reproduced as seen in Fig. 1. It is clear from this data and from the $^{11}B(d,n)^{12}C$ vector analyzing power data[4] that it is not possible to obtain good fits to analyzing power data for (d,n) reactions

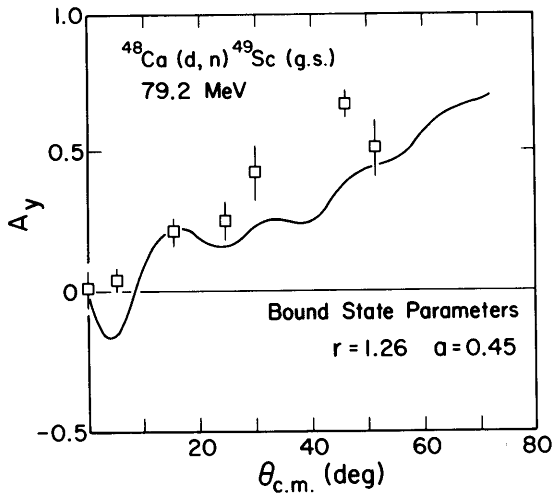

Figure 1. Angular distribution of the vector analyzing power for the ^{49}Sc ground state compared with adiabatic approximation calculation.

at 80 MeV even when reasonable efforts are made. Efforts to determine the cause of this difficulty are underway.

1) R.C. Johnson and P.J.R. Soper, Phys. Rev. C 1, 976 (1970).

2) Program DWUCK4, P.D. Kunz (unpublished); Extended version of J.R. Comfort (unpublished).

3) C.C. Foster et al., IUCF Scientific and Technical Report 1983, p. 120.

4) This report p. 85.