

THE ${}^7\text{Li}(p,\pi^-){}^8\text{B}$ REACTION

Z.-J. Cao, R.D. Bent, H. Nann and T.E. Ward
 Indiana University Cyclotron Facility, Bloomington, Indiana 47405

Since full shell model calculations are tractable in the p-shell and codes are available, it is hoped that the ${}^7\text{Li}(p,\pi^-){}^8\text{B}$ reaction will provide an early and useful test of the two-nucleon model code for pion production being developed in this laboratory.¹ Lithium 7 is the lightest target for which the (p,π^-) reaction leads to bound final states.

Earlier measurements² of this reaction were made with unpolarized beam. Because analyzing powers are a sensitive test of details of the reaction mechanism, these measurements were repeated during 1984 with polarized beam.

Fig. 1 shows spin up and spin down spectra obtained at $T_p = 199.6$ MeV and $\theta_\pi(\text{LAB}) = 30^\circ$. Fig. 2 shows the angular distributions of the differential cross sections and analyzing powers for the transitions leading to the ground state and to the 0.78 and 2.32 MeV excited states of ${}^8\text{B}$. These results will be

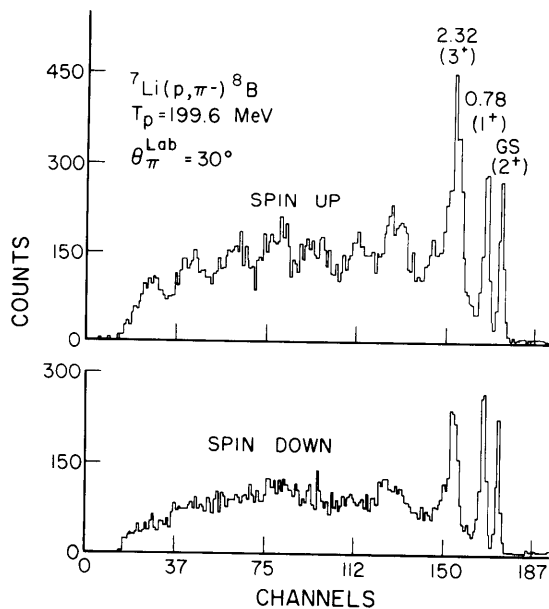


Figure 1. Spin up and spin down pion spectra from the reaction ${}^7\text{Li}(p,\pi^-){}^8\text{B}$ at $T_p = 199.6$ MeV and $\theta_{\pi\text{LAB}} = 30^\circ$.

compared with predictions of the two-nucleon model.¹

- 1) J.S. Conte et al., this report, p. 68.
- 2) J.J. Kehayias et al., IUCF Scientific and Technical Report 1982, p. 87.

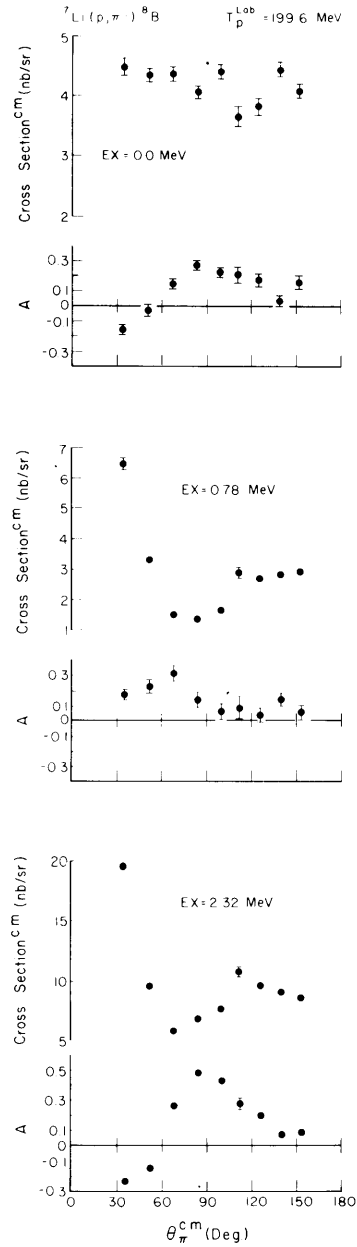


Figure 2. Angular distributions of the cross sections and analyzing powers for the reaction ${}^7\text{Li}(p,\pi^-){}^8\text{B}$ leading to the ground state and the 0.78 and 2.32 MeV excited states of ${}^8\text{B}$.