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Initial studies of the $A(p, \pi^+) A+1$ reaction at IUCF using the QDDM spectrograph have concentrated on the energy-dependence of the reaction. The spectroscopy of the reaction to different excited states of the residual nucleus has not been emphasized because of the small solid angle (3.4 msr) and energy bite (3 percent in momentum) of the QDDM spectrograph. With the much larger solid angle (~ 30 msr) and momentum range ($p_{\max}/p_{\min} \approx 1.6$) of the new QQSP spectrograph, spectroscopic studies with thin targets and high resolution will be practical. As a demonstration of the overall energy resolution that can be achieved in pion production studies at IUCF, Figs. 1-3 show examples of spectra taken with the QDDM spectrograph at 200 MeV bombarding energy and $\theta_{\pi}(\text{lab}) = 25$ deg.. Earlier Uppsala spectra¹⁾ are shown in the insets for comparison.

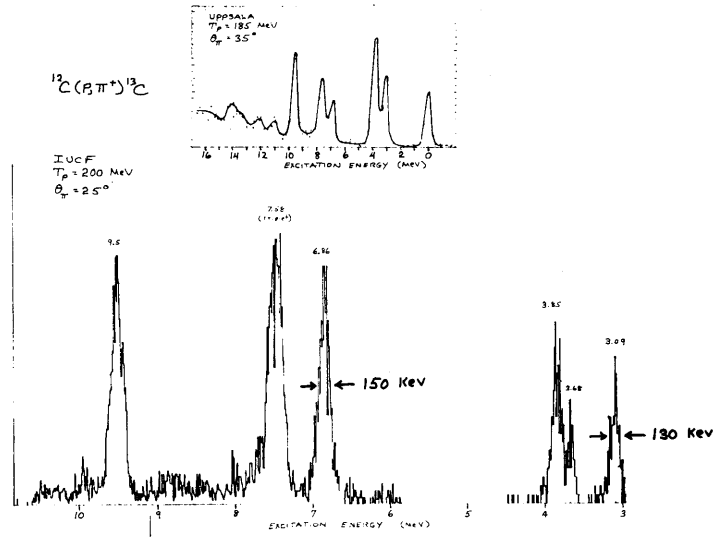


Figure 2.

- 1) S. Dahlgren et al., Nucl. phys. A227 (1974) 245, and references therein.

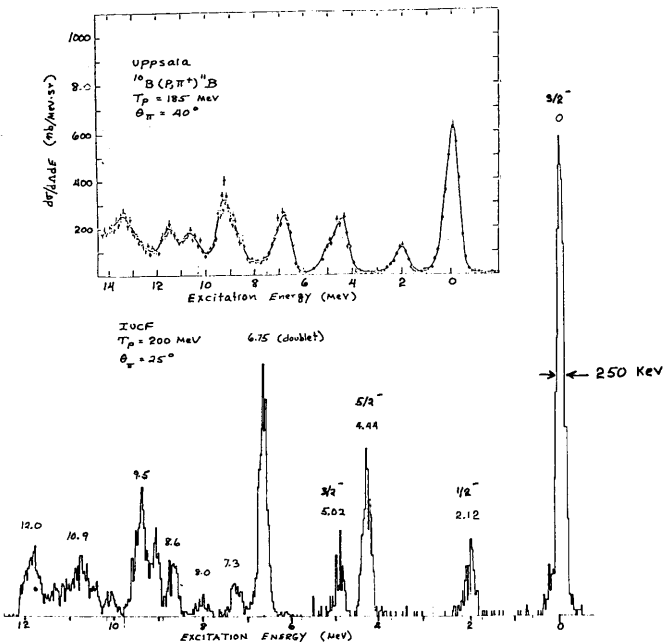


Figure 1.

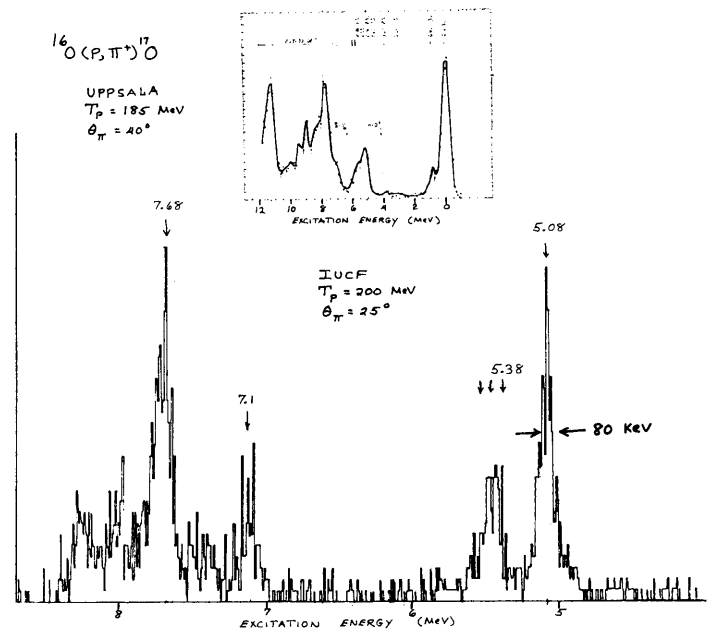


Figure 3.