

It is apparent that the  $f_{5/2}$  particle strength is fragmented and may extend into the region where the subtraction effects are severe. The quantitative

extracton of the  $f_{5/2}$  strength awaits a careful evaluation of the subtraction uncertainties.

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### MEASUREMENTS OF $^{17,18}\text{O}(p,n)$

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In an effort to increase our understanding of the distribution of Gamow-Teller (GT) strength and to try to shed light on the missing strength problem we are trying to study nuclei for which the shell model space in a first order calculation is so small that all the expected levels can be easily counted. We wish to scan the excitation region where these levels lie as well as the region somewhat above it under experimental conditions that put as little non-GT background in the spectrum as possible. The exploration of  $^{17}\text{O}(p,n)$  and  $^{18}\text{O}(p,n)$  meet the shell model criteria, but oxide targets put background in the region of interest from the other chemical ingredient and with gas targets the ratio of window nuclei to gas nuclei is unfavorable, especially for targets suitable for use in the beam swinger.

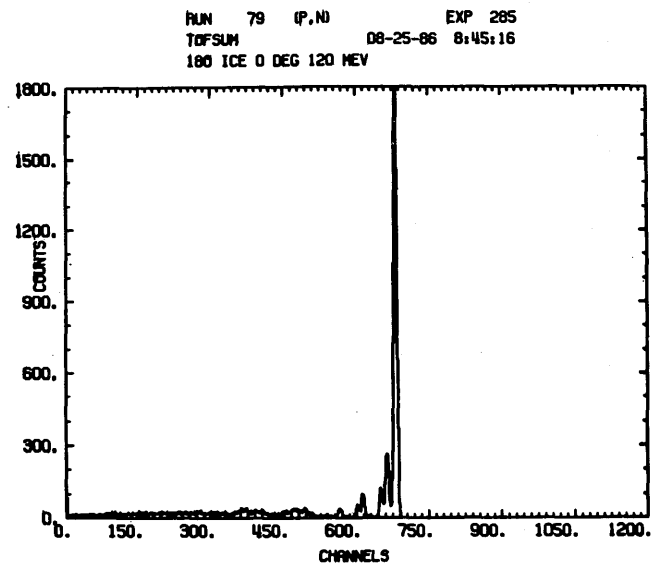


Figure 1.  $^{18}\text{O}(p,n)$  time-of-flight spectrum. This is raw data with no background subtracted.

We have, therefore, built an ice target and measured (p,n) spectra from frozen, isotopically enriched water. The ice requires cover foils to prevent sublimation of the ice in the vacuum, but because the foils do not need to have the structural strength to withstand gas pressure, they can be quite thin. We used polystyrene film 1.25 mg/cm<sup>2</sup> as cover foils. This gave us 2.5 mg/cm<sup>2</sup> total foil over 100 mg/cm<sup>2</sup> ice.

The refrigerator is a simple freon system using a capillary tube for flow control. The evaporator is simply a hollow volume in the target frame holder. This chills to about -40° F.

A zero-degree neutron spectrum from <sup>18</sup>O is shown in Fig. 1 on a linear scale. This spectrum is raw data. No background subtraction is required. Data were taken at 0, 5, 10, and 15 degrees. The cross section in the continuum portion of the spectrum is essentially the same over the whole angular range. This is illustrated in Fig. 2 where the 0° and 10° spectra are overlaid on a logarithmic plot normalized to the integrated charge. The data are currently being analyzed.

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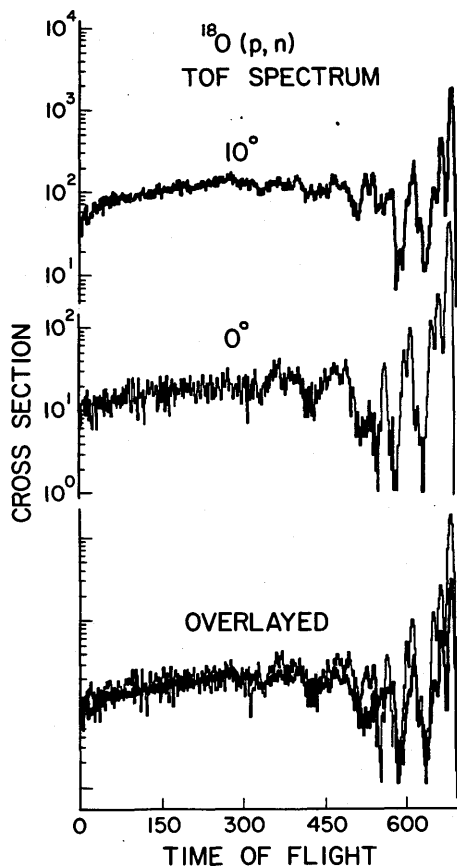


Figure 2. <sup>18</sup>O(p,n) time-of-flight spectra for 0° and 10° plotted on a logarithmic scale so that they can be overlaid for comparison. The cross sections for the peaks at low excitation energy fall off rapidly, but the cross section in the continuum is essentially constant in angle.