# STUDY OF BETA-DELAYED NEUTRON DECAY OF $^{22}$N*

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The rapid change in the location of the neutron dripline as one goes from carbon, to oxygen, to fluorine isotopes is still not understood. It has been suggested that the usual shell structure changes significantly in the region of the heaviest oxygen and fluorine isotopes. Recently, the doubly magicity of $^{22}$O is evidenced by the observation of a relatively high first excited state comapared to the neighboring even-even oxygen isotopes. The study of the energy levels in $^{22}$O has been particularly important for understanding the changes of nuclear structure in this region. One way of exploring information on $^{22}$O is to combine the traditional study of the beta-delayed gamma-ray decay of $^{22}$N with beta-delayed neutron spectroscopy.

The first measurement of beta-delayed neutrons and gamma-rays from the decay of $^{22}$N has been performed at the NSCL. The isotope was produced by fragmenting a 140 MeV/A 48Ca beam in a Be target and then separated from the other reaction products with the A1900 projectile fragment separator. $^{22}$N was implanted in a plastic scintillator and the decay was observed in a neutron array and in eight HpGe gamma-ray detectors from NSCL-SeGA. The beta-delayed neutron time-of-flight spectra were analyzed in conjunction with beta-gamma coincidence spectra to determine the emission probabilities and the branching to neutron-unbound and bound states of $^{22}$O. The beta decay scheme of $^{22}$N will be presented and compared to USD shell model calculations.

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