Proton stripping spectroscopic factors from the \( ^{59}\text{Co}(a,t)^{60}\text{Ni} \) reaction to known \( 8^- \) states of configuration \( (f_{7/2}^2 g_{9/2}) \) have been obtained and compared to \( B(M1) \) electron scattering strengths. This work has been accepted for publication. A similar analysis for the \( ^{51}\text{V}(a,t)^{52}\text{Cr} \) reaction could not be carried out until the \( 8^- \) states were located by inelastic scattering. This information is now available for many states and is complemented by pion inelastic scattering results.

Figure 1 shows a sample stripping spectrum for the \( ^{51}\text{V}(a,t)^{52}\text{Cr} \) reaction with a particularly prominent peak observed at 15.48 MeV. This is also the largest \( 8^- \) peak in electron scattering. Figure 2 shows the stripping angular distribution of this state compared to the DWBA calculation with 9\% of the \( 8^- \) \( T = 3 \) sum rule strength, using the methods of our \( ^{60}\text{Ni} \) analysis.

The lowest \( 8^- \) state in electron scattering was found at 8.099 MeV and was seen to be much stronger in \( \pi^- \) than \( \pi^+ \) scattering. This indicates that this is a neutron particle-hole promotion, and, indeed, we do not observe this state in proton stripping.

Many of the peaks seen in Fig. 1 exhibit \( \lambda = 4 \) stripping angular distributions. We will be able to extract spectroscopic factors for many of these that correspond to the \( 8^- \) states. In contrast to the case of \( ^{60}\text{Ni} \), where \( T = 2 \) and \( T = 3 \) final states are well separated, a broad distribution of \( 8^- \) strength is found in \( ^{52}\text{Cr} \), with only the 15.48 MeV peak showing appreciable concentrated strength. This runs counter to the idea that greater collectivity in \( ^{60}\text{Ni} \) would spread any single particle strength more widely there.

Figure 1. Composite spectrum from the \( ^{51}\text{V}(a,t)^{52}\text{Cr} \) stripping reaction at a bombarding energy of 80.9 MeV. The spectrum above 8 MeV excitation energy was taken at a laboratory scattering angle of 7° while that below 8 MeV was taken at 17°.
Figure 2. Experimental angular distribution for the 15.5 MeV state in the $^{51}$V($\alpha$,t)$^{52}$Cr stripping reaction compared to the DWBA calculation.