Proton-induced fission of targets $A=138$ to $A=130$ has been observed for $E_p=190$ MeV at the Indiana University Cyclotron Facility. A preliminary experiment has been done in the large scattering chamber using a pair of silicon surface barrier detectors ($E_1$ and $E_2$) in coincidence and a carbon-foil, channel-plate start detector in one detector arm for TOF mass identification. The $^{238}\text{U}(p,f)$ angular correlation is similar to low-energy fission and the mass distribution is mostly asymmetric for $(\theta_1-\theta_2)=180^\circ$ in the center-of-mass (Fig. 1). These preliminary data suggest that the width of both the total energy distribution and the mass distribution may increase substantially for $A<160$ (Fig. 2). Such an increase may indicate the onset of LDM instability to asymmetric fission (Businaro-Gallotte point).

The results will be compared with higher energy proton data and with cascade/fission predictions. The latter are applicable at IUCF proton energies since they are at low angular momenta, involve small mass transfers and are below pion-production thresholds. This will permit one to extract fission barriers (for $A<200$) for comparison with results derived from both high-energy heavy ions and protons of energy greater than 200 MeV.

![Figure 1. Mass distributions inferred for 190 MeV proton-induced fission on various targets as a function of $\theta_1-\theta_2$, the detector settings.](image)
A STUDY OF THE DECAYS OF $^{194,195,196}_{\text{Pb}}$

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Decay properties of $^{194,195,196}_{\text{Pb}}$ have been studied using singles and coincident $\gamma$-ray spectroscopy. Sources were produced by the 95 MeV $^{197}\text{Au}(^{6}\text{Li},x\text{n})$ reactions. No direct evidence for the decay of a low-spin isomer of $^{195}_{\text{Pb}}$ was observed. Several new levels were observed in $^{195,196}_{\text{Tl}}$, and are interpreted in terms of a rotational model. The low-lying states of the odd Tl nuclei are especially interesting in view of their proposed oblate deformation. States of fairly high spin in these nuclei can be studied by observing the $\gamma$-rays following the $\beta$/EC decay of the isomeric $13/2^+$ levels of the odd Pb nuclei.

The decay of the $13/2^+$ isomer in $^{195}_{\text{Tl}}$ has been investigated by several groups. High-spin states of $^{195}_{\text{Tl}}$ have also been studied using in-beam $\gamma$-ray spectroscopy. These studies are summarized in a recent compilation, which includes a preliminary report of the decay of $^{195}_{\text{Pb}}$. Levels in $^{194,196}_{\text{Tl}}$ populated by $^{194,196}_{\text{Pb}}$ decay have been known for some time.

The present study is an extension of our previous...