Ashton Short (Angelo State University)

Mentor: Dr. Dave Youngblood

Reconciling Giant Resonance Data

Isoscalar Giant Resonances (GR), which are shape oscillations of the nucleus involving highly collective motion of the nucleons, are of particular importance because they can tell us bulk properties of a nucleus, such as its compression modulus. The quantities needed to obtain these bulk properties are the strengths and energies for each resonance. Where distinct peaks are apparent in the data, most researchers have carried out Gaussian fits to obtain the energies of the resonances. A large amount of data has been obtained, and analyzed in this manner over the years by several groups including the TAMU group. A group working at Osaka University in Japan have also obtained data on many nuclei, but used fits to a Lorentzian or Breit-Wigner shape to obtain the energies and strengths. The aim of this project was to gather the results from the Osaka group, digitize the published multipole distributions, and fit the peaks with Gaussian distributions to allow direct comparison with the TAMU work, as well as earlier works. The Osaka group also published primarily radiative strength distributions, while the TAMU group publishes energy-weighted-sum-rule (EWSR) strength distributions which can be used to obtain energy moments. The radiative strength distributions from the Osaka group were converted to EWSR strength distributions and the energy moments were then calculated for comparison to the TAMU work. The accompanying graphs show the original and modified Osaka results and compares them to other works.