1105-65-229 **Cody Samuel Lorton*** (clorton@uwf.edu). *An unconditionally stable discontinuous Galerkin method for the elastic wave equations in the frequency domain with large frequency.*

Wave scattering arises in many scientific and engineering fields including geosciences, materials science, and medical science, computing high frequency waves is challenging due to the shear amount of computations involved and the strongly indefinite nature of these problems. This talk is concerned with numerical approximations of elastic waves in the frequency domain which are described by the elastic Helmholtz equations. The focus of the talk is to present an interior penalty discontinuous Galerkin (IP-DG) method for the elastic Helmholtz equations. The proposed IP-DG method is proved to be unconditionally stable with respect to both frequency $\omega$ and mesh size $h$, while the existing numerical methods for the elastic Helmholtz equations are only proven to be stable in an asymptotic mesh regime when $\omega^\alpha h = O(1)$ for some $\alpha \geq 2$. Error estimates, which show explicit dependence on the frequency (and mesh size), are also obtained for all mesh regimes. Numerical experiments will be presented to demonstrate the accuracy of the proposed IP-DG method and its advantages over standard finite element methods. This talk is based on a joint work with Xiaobing Feng of the University of Tennessee at Knoxville. (Received September 21, 2014)