

SES19-2019-000162

Abstract for an Invited Paper  
for the SES19 Meeting of  
the American Physical Society

### **Plans for a Measurement of Charged and Neutral Pion Polarizabilities with GlueX**

MARK ITO, Jefferson Lab

We report on the status of preparations for a measurement of the charged pion polarizability. The experiment is approved to run in Hall D at Jefferson using the GlueX detector. In addition we report on plans for a proposal to measure the neutral pion polarizability, also with GlueX, to run simultaneously with the charged pion experiment. For both charged and neutral pions the polarizabilities are fully predicted at leading order in quark masses, and thus represent a sensitive test of chiral dynamics. Polarizabilities are accessed through a measurement of the absolute cross section of  $\pi^+\pi^-$  and  $\pi^0\pi^0$  production near threshold via the Primakoff effect,  $\gamma\gamma^* \rightarrow \pi\pi$  where the virtual photon is provided by the Coulomb field of the target nucleus. Construction of a new detector system for identification of muon pair production, which present a background for the charged mode, are underway and will be described.