J/ψ Photoproduction Near Threshold Update

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Preliminary Results from RGA Spring Data

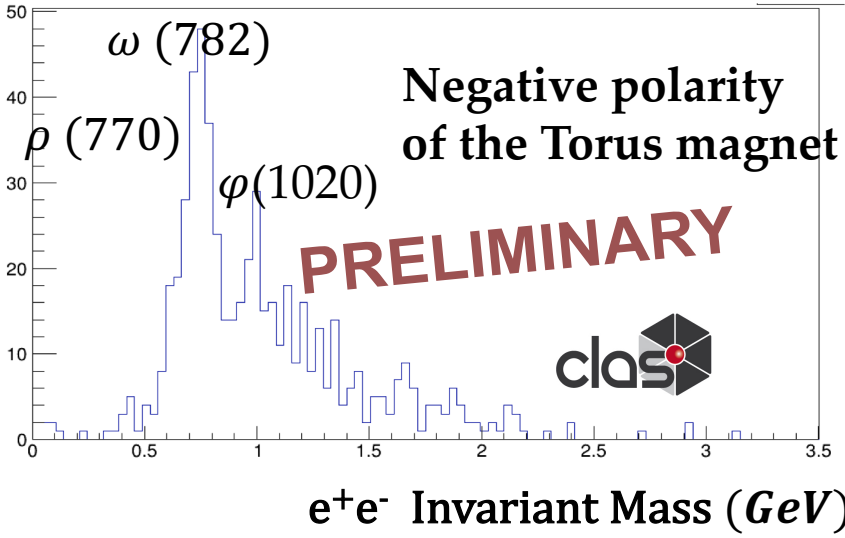
- Detect lepton pair (from J/ψ decay) and scattered proton

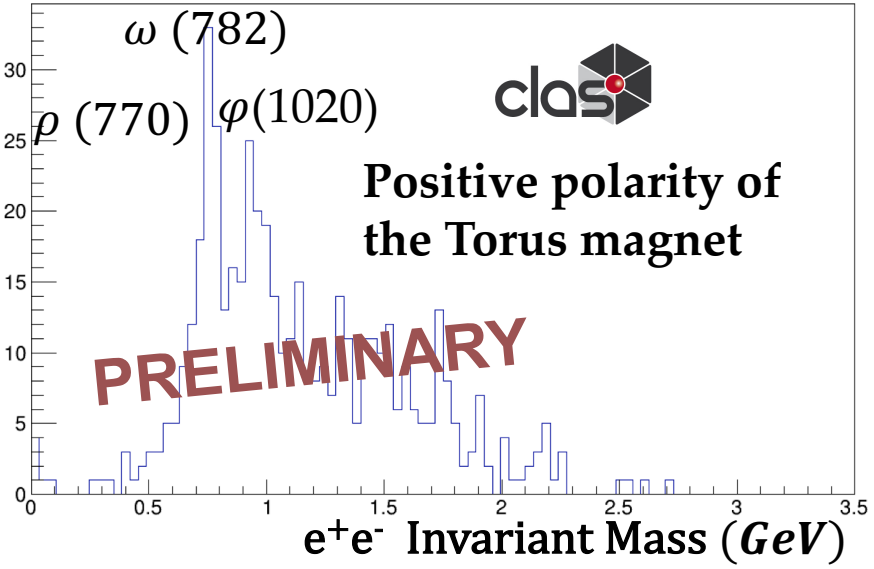
$$ep \rightarrow e^+e^-p'(e')$$

- Goal is to probe the distribution of color charge by measuring the differential cross section t-dependence and the production mechanism of J/ψ as a function of photon energy

- Events are selected based off of kinematics of the scattered, forward-moving electron, which indicates quasi-real photoproduction

- 2% of total expected data was presented at the DNP, which included analysis of e+e- invariant mass spectra for two magnet polarities





Requirements and Work Plan For Successful Analysis

- A well-calibrated FTOF is crucial for hadron identification
- A well-calibrated PCAL and ECAL will be crucial for lepton identification. Specifically, calorimeter responses will need to be well-understood for lateral energy dispersion (2nd and 3rd moments) in order to distinguish electromagnetic and hadronic showers
- A well-calibrated HTCC will be important for electron and positron identification
- For DC tracking, the efficiency needs to be understood as well as the radiative loss of leptons in the material for the purpose of getting accurate missing mass and momentum cut calculations
- Kinematic fitting will be important for optimizing the calculation of the trajectories and momenta information of all three final-state particles
- Acceptances in bins of photon energy and momentum transfer will be calculated for upgraded software versions using simulations that are processed with the UNH farms
- Fiducial cuts will be applied to prevent leakage of electromagnetic showers