Measurement of the Neutron Magnetic Form Factor at High Q^2 Using the Ratio Method on the Deuteron[1] LAMYA BAASHEN, BRIAN RAUE , Florida International University, GERARD GILFOYLE, University of Richmond, COLE SMITH, University of Virginia, CLAS12 COLLABORATION — The elastic electromagnetic form factors are important observables for understanding the structure of the nucleon. Measuring all four elastic form factors,G_E^p,G_M^p,G_E^n,and G_M^n,at high Q^2 is a central part of the physics programs at Jefferson Lab. In this talk we will focus on the measurement of neutron magnetic form factor, G_M^n, at high Q^2 using the CLAS12 detector. To extract G_M^n we use the ratio of quasi-elastic $e-n$ to $e-p$ scattering on a deuteron target. This method reduces the impact of systematic uncertainties like luminosity, etc. We apply acceptance matching in constructing the ratio. We use the measured electron information and, assuming QE kinematics, predict the path of both a neutron and a proton through CLAS12. If both paths strike CLAS12 we keep the event. A precise measurement of the ratio requires determining neutron detection efficiency (NDE) of the calorimeter in CLAS12. To do that we use the $p(e,e'\pi^+)n$ reaction on hydrogen target to produce tagged neutrons. We use the measured e' and π^+ to predict where the neutron will strike CLAS12 and then search for neutron in that region. In this talk, We will discuss our methods and show preliminary results for the CLAS12 NDE. [1]Supported by the US Department of Energy

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