Event selection in electron scattering from an unpolarized deuterium target.[1] XIAODI HU[2], MATTHEW HEYRICH, GERARD GILFOYLE, University of Richmond — We are using Jefferson Lab's 11-GeV electron beam incident on a deuterium target and the CLAS12 detector to measure the electromagnetic form factor of the neutron. We developed and tested code to extract kinematic quantities for quasielastic(QE) event selection. A full simulation chain has been developed and is managed by shell and perl scripts on the Richmond Computing Cluster. Quasi-elastic events are generated with QUEEG and inelastic ones with Pythia. Both sets go through gemc, a CLAS12-standard, physics-based Monte Carlo built on geant4. The simulated events are reconstructed with the CLAS12 Common Tools. We wrote the post-reconstruction analysis code in Apache Groovy, a JAVA-like scripting language. To select electrons we apply fiducial cuts to define the electromagnetic calorimeter (EC) active volume and constrain the sampling fraction (ratio of electron energy deposited in the EC to measured electron momentum). We isolated QE events from inelastic background using cuts on θ_{pq} (angle between 3-momentum transfer and the nucleon), and the hermiticity (number of final-state particles). Initial results on extracting the QE component are consistent with the experimental specifications.

Gerard Gilfoyle
University of Richmond

Date submitted: 22 Jul 2019   Electronic form version 1.4