Software to Monitor CLAS12 Data Quality[1]

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The physics program at Jefferson Laboratory will probe the quark substructure of the nucleus with the Continuous Electron Beam Accelerator Facility (CEBAF). We use the CEBAF Large Acceptance Spectrometer (CLAS12) to measure the charge, momentum, and energy of particles produced by electron-nucleus collisions. We are developing software to monitor data quality from the analysis of a scheduled experiment that will measure the neutron magnetic form factor (G_M^n) among at least six other experiments. The monitoring code was written with a java-like scripting language called groovy and uses the CLAS12 Common Tools. To test the code we generated quasielastic events and simulated the CLAS12 response with the Monte Carlo code gemc. The events were reconstructed and analysed to extract monitoring observables. For example, we obtained the electron sampling fraction as a function of run number. The sampling fraction is the energy deposited in an electromagnetic calorimeter divided by the momentum and is expected to be constant. We will show simulations of the sampling fraction, ratio of protons to electrons and other quantities versus run number.

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