Software development for the effective utilization of event-recording data of TrigNET at MLF, J-PARC

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The Materials Life Science Facility (MLF) in the Japan Proton Accelerator Research Complex (J-PARC) adopted the event data recording methods on the data acquisition system (DAQ). In this method, both of the time and position information for neutron detections are recorded. Recently we developed successfully a DAQ electric module TrigNET, which records common electric signals as events synchronized with pulsed neutron generation. TrigNET will be connected with instrument devices, e.g. sample direction from goniometers, thermometers for sample and phase information from choppers controller. By analyzing events from TrigNET, neutron events can be filtered for each condition users want to see. This filtering method enables users to measure and analyze the information of the sample under various outer conditions more easily. For example, to measure excitations over wide momentum transfer and energy space in a single crystal, we had to carry out tens of measurements with ‘step-by-step’ rotating sample direction and manage many data. However, by using this method we need only one measurement and data with ‘continuous’ rotating sample direction. In addition, this method will be utilized on measurements of phenomena induced by magnetic field or pressure and so on.

In this presentation, we will show the current status of analysis software development for the filtering of event data with conditions of instrument devices.