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Data processing and simulation in PandaX-4T

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PandaX-4T is a multi-purpose detector employing the liquid xenon technology. It can be used to study the dark matter, solar neutrinos, supernova neutrinos as well as the neutrinoless double beta decay of Xe136. The detector has nearly 500 readout channels, each digitizing data at the sampling rate of 250 MHz. The output data rate of the detector when taking the background data is about 30-40 MB/s, and that can reach about 300 MB/s when taking calibration data. Selected data will be processed on site to produce data quality plots. All the data will be transferred to the processing center in Chengdu through high speed special network connection and be processed there. Specially designed data structure based on the high speed I/O library enables the fully reconstruction of physical quantities from one raw data file to be finished in 2-3 mintues. I will talk about the details of the data structure and processing in PandaX-4T. Data simulation in PandaX-4T will also be discussed, by emphasizing the specially designed BambooMC program based on Geant4.

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