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Digital Trigger Module for Cherenkov Time of Flight Detector

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The ATLAS Forward Proton (AFP) project extends the forward physics program of the multipurpose ATLAS detector located at LHC in CERN. The time-of-flight (ToF) detector measures the time delay of the detected high-energy protons (HEPs) during the multiple proton-proton collisions. Due to the high luminosity at LHC the number of events detected by ToF is enormous as well as the amount of data produced. The main purpose of the digital trigger module (DTM) is to select the events relevant to the ongoing physical experiment. The DTM input signals are compared with the remotely set logical conditions. Then the module decides whether the input signals will pass to the following chain of ToF detector or not. The secondary function of the device is to send the control commands to the data acquisition system which stores the data from the selected levels (modules) of the ToF chain. The DTM performs the high-speed signal processing of the signals with rate up to 40 MHz (bunch clock frequency). The selection of the relevant events takes approximately 9 ns. After the full testing procedure (including the test in DESY and at the CERN beam test facilities) the DTM will be installed at LHC.

Minioral

No

IEEE Member

No

Are you a student?

Yes

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