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The ATLAS Forward Proton Real-Time Time-of-Flight Trigger and Trigger Decoder for LHC Run 3

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We describe the in-line real time trigger module that provides a majority trigger decision for the ATLAS Forward Proton detector (AFP). A forward proton traverses a sequence of four successive Cherenkov radiators (a "Train") connected to a fast multi-anode MCP Photomultiplier. Four such trains are mounted next to one another and subdivide the AFP acceptance for diffractive protons is "slices"with roughly equal occupancy. Every Train that passes the majority trigger encodes a "bit"in the 5-bit trigger word (the first bit is an "OR"of all trains firing) that is sent over a 220 m foam-core coax cable towards the ATLAS Central Trigger Processor (CTP). The fast real-time Trigger Processor is described, including the trigger decoder that interfaces with the CTP.

Collaboration

ATLAS Collaboration

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