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Laser Testing for the ATLAS Forward Proton Time of Flight Detector IAN HOWLEY, ANDREW BRANDT, The University of Texas at Arlington — In 10 trillionths of a second light travels 3mm. Our group at UTA is currently developing the most precise time of flight (TOF) detector ever deployed in a collider experiment, with a resolution on this 10 picosecond scale. In conjunction with several other universities we have proposed to install a fast timing system as part of a proton detector upgrade to the main ATLAS detector at the Large Hadron Collider (LHC) . Precise measurement of the timing of proton tracks will allow rejection of background to the physics processes of interest, which include the elusive Higgs Boson. Laser based tests at UTA allow us to measure the response of our detectors downstream electronics including constant fraction discriminators, amplifiers and most importantly the microchannel plate photomultiplier tubes, which are at the heart of this fast-timing system. By isolating the individual components of the detector in this fashion, we can fully characterize each device's response. My research is part of the ongoing data analysis using the CERN analysis package ROOT. By closely examining the pulse height, time difference distributions, and transit time spread (TTS) we are be able to understand the performance of the detectors and electronics in laser and beam tests to better prepare ourselves for future test beams and eventually full scale installation and operation. I will present the latest performance test results from data I have analyzed.

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