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Measuring the Dark Current of the ATLAS Muon Spectrometer JOSEPH MINNELLA, BING ZHOU, University of Michigan, ATLAS COLLABORATION — The Muon Spectrometer is the outermost detector of the ATLAS experiment which consists of many chambers filled with Muon Drift Tubes (MDT) that are used to collect data from the Muons created at the LHC. Each of the MDTs is filled with an ionizable gas and a wire with a high voltage applied across it so that when a Muon passes through an MDT, it ionizes the gas and sends an avalanche of electrons to drift to the wire and provides us with an event signal. A collection of multiple tubes allows us to recreate the path of the Muon through the chamber. Based on this set up, in order to get the most accurate data from the MDTs, one should be aware of how much dark current is present in the MDTs. Dark current is essentially a material-intrinsic background current created even when the electronics are powered off. As one would imagine, these currents are very small – typically on the order of nano-amps. Therefore, in order to detect the dark current, the ATLAS group at the University of Michigan developed a circuit board using current amplification to measure this small current. The focus of this presentation will be how the electronic boards were developed, constructed and installed on the MDT test stand at the University of Michigan.

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