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# ATLAS Muon Chamber Ageing Studie

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The search for hisgh-energy particles continues at CERN, in the ATLAS detector. Due to the rarity of events such as the production of the Higgs, it is necessary to increase the luminosity of the LHC. In preparation for this increase, there are several upgrades which must be made to the ATLAS detector to take advantage of the increased event rate, and not be swamped by data. One of these upgrades is to the forward muon detectors in the small wheels, referred to as the New Small Wheels (NSW). These small wheels contain small Thin Gap Chambers (sTGC) which will contribute to the trigger system and give resolution data for muons. This will assist in the discrimination of signal from noise, and allow to trace particle trajectories. To establish the stability of these detectors, ageing studies were performed at TRIUMF in Vancouver, Canada. These studies simulated 150 years of operation of the LHC (8 Coulombs of accumulated charge/cm2), and are presented here. A test stand apparatus was used to simulate the conditions of the chamber in the LHC. The test stand included a gas mixing system, humidity control, and monitored atmospheric pressure and temperature to control variables. Data was also collected from a control chamber not exposed to a weak radiations source to eliminate environmental fluctuations. Both chambers were exposed to Strontium 90 sources over a period of one month. The study reveals that there is no strong evidence of ageing in the studied sTGCs.

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