Long Term Irradiation Study of ATLAS sMDT Drift Tubes Using Beta-Electrons From a Sr90 Source Accumulating Almost 40 C Per Wire

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Two 50 cm long prototype sMDT drift tubes have been irradiated using beta-electrons from $^{90}$Sr-$^{90}$Y decays with end point energy of 2.28 MeV. Over two periods of 100 days and 125 days, respectively, the tubes were drawing constant currents of 3 uA and 1.25 uA. Regions of approximately 10 cm of the wires were irradiated intensively. Almost 40 C of charges have been accumulated in these regions on each wire.

As detector gas Ar:CO2 93:7 Vol-% was used at 3 bar absolute, the anode voltage of 2730 V was extremely stable over the whole period. Pressure and temperature were monitored together with anode-voltage and amplification-current in the drift-tube.

We report on the experimental method and the setup and conclude from the observation of constant current over the whole period that no reduction in performance has been observed and thus no sign of long-term deterioration.

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