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Construction and commissioning of a setup to study ageing phenomena in high rate gas detectors

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A very accurate apparatus has been constructed and commissioned at the GSI detector laboratory, which will be dedicated for many objectives. Among these objectives; investigation of the ageing phenomena of high rate gaseous detectors, the ageing influences of the construction materials of the gaseous detectors, long term monitoring of gaseous detectors tolerance, planned to be used in The Compressed Baryonic Matter (CBM) experiment at the future Facility for Antiproton and Ion Research (FAIR) in Darmstadt, Germany. It is very important, in ageing studies, to sense the detector degradation, if any, in reasonable time period and with a particle rate comparable to that in real experiments. In order to reach the envisaged accuracy, several optimizations have been implemented over the design of the used counters, the setup approach and automation and the gas system.
In this article, details of the experimental setup, the systematic optimization tests, studies of ageing and anti-ageing manifestations, and results of the influence of different construction materials will be presented.

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