

## Development and Performance of spark-resistant Micromegas Detectors

The luminosity upgrade of the Large Hadron Collider at CERN (sLHC) foresees a luminosity increase by a factor five compared to the LHC. To cope with the corresponding increase in background rates, the Muon System of the ATLAS experiment at CERN will need major changes in the high rapidity region. The Muon ATLAS MicroMegas Activity (MAMMA) focuses on the development and testing of large-area muon detectors based on the bulk-Micromegas technology as candidates for such an upgrade. In order to overcome the spark problem a novel protection scheme using resistive strips above the readout electrode has been developed. A study of the response and sparking properties of resistive micromegas detectors in a mixed (neutron and gamma) high radiation field has been performed. The neutrons are supplied by the Tandem accelerator, at the N.C.S.R. "Demokritos" in Athens. Furthermore the chambers have been studied in a X-ray test facility in hadron beams, and in the ATLAS cavern with two-dimensional readout.

Results on the performance of these chambers will be presented which will combine trigger and precision tracking in a single device. Monte-Carlo studies have been employed to study the effect of 5.5 MeV neutrons and also response of the detector on the photons originating from the inevitable neutron inelastic scattering in comparison with experimental data. Finally the layout of the 2D chambers and their performance, with special focus on the charge-up behavior of the chambers under high particle fluxes, is presented.

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