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Rate Capability of Doped Linseed Oil coated Bakelite RPCs
ZARAH AHMAD, Southeast Missouri State Univeristy, PHENIX COLLABORATION, UNIVERSITY OF ILLINOIS AT URBANA CHAMPAIGN TEAM — Bakelite Resistive Plate Chambers (RPCs) are used as muon trigger detectors for the PHENIX experiment at RHIC and the CMS and ATLAS experiments at LHC. These muon trigger RPCs are gas detectors in which high voltage is applied across two Bakelite plates spaced 2 mm apart. The detector gas is 95% R134-a, 4.5% isobutene and 0.5 % SF6 The rate capability of Bakelite RPCs is limited by the time it takes to re-store the initial charge distribution on the dielectric plates after the ionization charge from an avalanche has been collected on the plates. The rate capability depends on the bulk and surface resistivity of the Bakelite plates and its coating. We have doped the linseed oil coating used in the PHENIX RPCs to lower the surface resistivity of the coated Bakelite plate. The rate capability of the modified RPCs was studied using measurements of the RPC detection efficiencies for cosmic rays in presence of high rate backgrounds from two Fe55 radioactive sources. We will present methods for the production of doped linseed oil coats and discuss status and results from rate capability measurements.

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