Contribution ID: **119** Type: **Poster**

Precision Muon Tracking Detectors and Readout Electronics for Operation at Very High Background Rates at Future Colliders

Wednesday, 27 May 2015 09:33 (0 minutes)

The experience of the ATLAS muon spectrometer shows that drift-tube chambers provide highly reliable precision muon tracking over large areas. The ATLAS muon chambers are exposed to unprecedentedly high background of photons and neutrons induced by the proton collisions. Still higher background rates are expected at future high-energy and high-luminosity colliders beyond HL-LHC. Drift-tube detectors with 15 mm tube diameter (30 mm in ATLAS) and improved readout electronics optimized for high rate operation have been developed for such conditions. Tests at the Gamma Irradiation Facility at CERN showed that the rate capability is improved by more than an order of magnitude compared to the ATLAS chambers as space charge effects are strongly suppressed and operation with minimal electronics deadtime becomes possible. Studies of the new readout electronics will be discussed. Several full-scale chambers have been constructed with unprecedentedly high sense wire positioning accuracy of better than 10 micron. The chamber design and assembly methods have been optimized for large-scale production, reducing considerably cost and construction time while maintaining the high mechanical accuracy and reliability. Precise mounting of optical sensors with respect to the sense wires is essential for achieving the required accuracy of the chamber alignment system and is integral part of the assembly procedure.

Primary author: KROHA, Hubert (Max-Planck-Institut fuer Physik)

Co-authors: KORTNER, Oliver (Max-Planck-Institut fuer Physik); SCHWEGLER, Philipp (Max-Planck-Institut fuer Physik); RICHTER, Robert (Max-Planck-Institut fuer Physik); NOWAK, Sebastian (Max-Planck-Institut fuer Physik)

Presenter: KROHA, Hubert (Max-Planck-Institut fuer Physik)

Session Classification: Gas Detectors - Poster Session

Track Classification: S7 - Gas detectors