

## “Absolute Luminosity For ATLAS” – From installation to first data physics data

The ALFA detector system (Absolute Luminosity For ATLAS) aims for measuring the absolute LHC luminosity with high precision by using pp-scattering under small angles. Scintillating fibers tracking detectors are positioned 240 m from LHC interaction point 1 inside Roman Pots at millimeter distance from the LHC beam axis. The detectors consist of layers of 64 scintillating square fibers of 500  $\mu\text{m}$  size in a U-V configuration. The layers are staggered 10 times to improve the spatial resolution to about 30 micrometers. A total of 11680 scintillating fibers are read out on the 8 ALFA detectors through 184 Multi Anode Photomultiplier Tubes with 64 channels each. Each detector has dedicated scintillating trigger tiles read out by 8 mm Photomultiplier Tubes via clear fibers.

The ALFA detectors system was installed during the winter shutdown 2011-2012. Since then the detectors system has been undergoing commission. This includes building of a standalone trigger and DAQ system as well as the integration into the central ATLAS trigger and DAQ system.

The movement system for the Roman Pots has been commissioned to only allow movement from the central CERN control room. The Roman Pots has been aligned to the beam using “scraping” (beam based alignment). This compliments the survey and metrology measurement previously made and gives the actual beam position with high precision.

In the last days with proton beam in 2011 a special optics with  $\beta^* = 90$  m was used in LHC and this allowed a total cross-section measurement using ALFA integrated in ATLAS.

Based on the experience from 2011 a few upgrades of ALFA are being prepared for 2012 and beyond. These are mainly to improve triggering.

**Primary author:** Mr JAKOBSEN, Sune (Niels Bohr Institute / CERN)

**Presenter:** Mr JAKOBSEN, Sune (Niels Bohr Institute / CERN)