The Minimum Bias Trigger Scintillators (MBTS) were successfully deployed and operated in ATLAS during the running period of 2010-2013, known as LHC Run-1. They provided highly efficient triggering for minimum-bias proton-proton and heavy-ion collisions. The radiation dose from Run-1 (~10^7 Gy) degraded the transparency of the scintillating medium heavily (~50%). Therefore, the MBTS underwent a complete replacement in preparation for LHC Run-2 (2015-2017).

**Overview**

The MBTS layout for LHC Run-2:
- Each MBTS counter composed of 2 cm thick polystyrene
- Light collected with wavelength shifting optical fibers (WLS) • Embedded into grooves at the edges of each MBTS counter
- WLS connected to clear optical fibers transporting light to PMTs • PMTs read out with electronics from the ATLAS Tile Calorimeter
- Reduced granularity and improved WLS routing scheme • Segmentation of both inner and outer sector reduced from two pieces to one • New WLS routing scheme maximises and homogenises light yield
- More flexible readout • 8 WLS are installed in both inner and outer sector • Outer sector foreseen to be read out with 4 WLS in the early phase of Run 2 • When radiation damage has degraded the scintillator transparency, light yield can be recuperated by opting for all 8 WLS

**Commissioning with Cosmic Rays**

A MBTS counter was characterised with cosmic radiation in a laboratory setup in order to study:
- The yield from the two sectors
- The attenuation of the single-clad clear fibers intended for installation
- Light yield determined with fit to spectra of integrated charge

\[ f(x) = N \frac{1}{\sqrt{2\pi \sigma}} e^{-\frac{(x-\mu)^2}{2\sigma^2}} \]

- Convolution of N Gaussians with Poissonians
- \( \mu \), determined from the fit, is a direct measure of the number of photoelectrons
- Remaining parameters characterise the PMT and are determined from the calibration

**Initial Run-2 Operation**

The Run-2 MBTS counters were integrated into the DAQ system in Summer 2014

**The timing of the MBTS trigger signals determined with first LHC Run-2 beam splashes (events induced by dumping beam on collimator)**
- Timing w.r.t. independent, single-sided ATLAS calorimeter trigger on outgoing splash particles
- Operations under beam-splash events indicate that the MBTS are well-timed in and ready for LHC Run-2

Maria Hoffmann (CEA-Saclay) for the ATLAS Collaboration