

Title: Projections of Beam Backgrounds and Minimum-Bias Events in ATLAS

Abstract:

The initial stages of the Large Hadron Collider (LHC) run are a source of critical information -- about the ATLAS detector and about the physics of pp collisions at  $\sqrt{s} = 14$  TeV, including parton distribution evolution and the cross-section of  $\sigma(pp)$ . The accelerator itself is the source of some detector interest, as we have a first look at what have so far been speculations on the quality of the vacuum in the experimental insertion, and the cleanliness of the beam from the accelerator. The shakedown period, with its low beam squeeze, low luminosity, and undemanding trigger menus, will continue to be very useful in addressing some of these questions, as it lacks the pileup and radiation levels that will arrive with higher luminosity -- making it an important opportunity to investigate minimum-bias events in relative isolation. For the short lifetime of the Minimum Bias Trigger Scintillators (MBTS), which are expected to fail within a few months of running, they will aid in discriminating the minimum bias signal of inelastic non-single-diffractive pp collisions. Using single- or double-coincidence signatures, the MBTS system and other trigger and analysis strategies attempt to avoid triggering on otherwise empty bunch crossings and eliminate the effects of beam-gas collisions and beam halo effects which would lead these spurious triggers and reduce the general minimum-bias trigger efficiency. The effects of beam halo and beam-gas interactions on the minimum-bias trigger response are explored. The signatures of the beam halo and beam-gas interactions are examined from the standard ATLAS tracking reconstruction.