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Development and Online Operation of Minimum Bias Triggers in ATLAS

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The design of minimum bias triggers should allow for a highly efficient selection on pp-collisions, while minimising any possible bias in the event selection. In ATLAS two main minimum bias triggers have been developed using complementary technologies. A hardware based first level trigger, consisting of 32 plastic scintillators, has proven to efficienctly select pp-interactions. In particular during the start-up phase this trigger played a crucial role for the commissioning of the central trigger processor and detector sub-systems. A complementary selection is achieved by a multi-level minimum bias trigger, seeded off a random trigger on filled bunches. For the event selection at higher trigger levels a dedicated algorithm was developed, able to cope with around 86 millions of detector signals per bunch-crossing. We will present these trigger systems and their deployment online, highlighting their performance and trigger efficiencies. We outline as well the operation with increasing beam intensities and luminosities.

Primary author: Ms KWEE, Regina (for the ATLAS Collaboration)

Presenter: Mr MARTIN, Tim (University of Birmingham, UK)

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