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ATLAS trigger status and results from commissioning operations

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The ATLAS trigger system is designed to select rare physics processes of interest from an extremely high rate of proton-proton collisions, reducing the LHC incoming rate of about 10ˆ7. The short LHC bunch crossing period of 25 ns and the large background of soft-scattering events overlapped in each bunch crossing pose serious challenges, both on hardware and software, that the ATLAS trigger must overcome in order to efficiently select interesting events. The ATLAS trigger consists of hardware based Level-1, and a two-level software based High-Level Trigger (HLT). Data bandwidth and processing times in the higher level triggers are reduced by region of interest guidance in the HLT reconstruction steps. High flexibility is critical in order to adapt to the changing luminosity, backgrounds and physics goals. This is achieved by inclusive trigger menus and modular software design. Selection algorithms have been developed which provide the required elasticity to detect different physics signatures and to control the trigger rates. In this talk an overview of the ATLAS trigger design, status and expected performance, as well as the results from the on-going commissioning with cosmic rays and first LHC beams, is presented.

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