Contribution ID: **360**   Type: **poster**

Muon Event Filter Software for the ATLAS Experiment at LHC

Thursday 30 September 2004 10:00 (1 minute)

At LHC the 40 MHz bunch crossing rate dictates a high selectivity of the
ATLAS Trigger system, which has to keep the full physics potential of the
experiment in spite of a limited storage capability.
The level-1 trigger, implemented in a custom hardware, will reduce the
initial rate to 75 kHz and is followed by the software based level-2
and Event Filter, usually referred as High Level Triggers (HLT),
which further reduce the rate to about 100 Hz.
In this paper an overview of the implementation of the offline muon
recostruction algortihms MOORE (Muon Object Oriented REconstruction) and
MuId (Muon Identification) as Event Filter in the Atlas online framework
is given.
The MOORE algorithm performs the reconstruction inside the Muon Spectrometer
providing a precise measurement of the muon track parameters outside the
calorimeters; MuId combines the measurements of all ATLAS sub-detectors
in order to identify muons and provides the best estimate of their
momentum at the production vertex.
In the HLT implementation the muon reconstruction can be executed in the
"full scan mode", performing pattern recognition in the whole muon spectrometer,
or in the "seeded mode", taking advantage of the results of the earlier trigger
levels.
An estimate of the execution time will be presented along
with the performances in terms of efficiency, momentum resolution
and rejection power for muons coming from hadron decays and for fake muon tracks,
due to accidental hit correlations in the high background environment of the
experiment.

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Session Classification: Poster Session 3

Track Classification: Track 2 - Event processing