

The ATLAS Level-1 Topological Processor: experience and upgrade plans

Thursday, May 27, 2021 5:12 AM (18 minutes)

During Run-2 the Large Hadron Collider has provided, at the World's energy frontier, proton-proton collisions to the ATLAS experiment with instantaneous luminosity of up to 2.1×10^{34} cm⁻²s⁻¹, placing stringent operational requirements on the ATLAS trigger system in order to reduce the 40MHz collision rate to a manageable event storage rate of 1kHz.

The ATLAS Level-1 trigger is the first rate-reducing step. Since 2017, an important role has been played by the Level 1 Topological Processor (L1Topo). Up to 128 topological algorithms can be implemented to select interesting events by applying kinematic and angular requirements on electromagnetic clusters, hadronic jets, muons and total energy. This resulted in a significantly improved background event rejection and acceptance of physics signal events.

We give an overview of the L1Topo architecture and performance results during Run-2 alongside with upgrade plans for the L1Topo system to be installed for the future data taking in 2022.

TIPP2020 abstract resubmission?

No, this is an entirely new submission.

Funding information

Primary authors: KAZAROV, Andrei (NRC Kurchatov Institute PNPI (RU)); SONAY, Anil (The Barcelona Institute of Science and Technology (BIST) (ES))

Presenter: SONAY, Anil (The Barcelona Institute of Science and Technology (BIST) (ES))

Session Classification: Posters: Trigger and DAQ

Track Classification: Readout and Data Processing: Readout: Trigger and DAQ