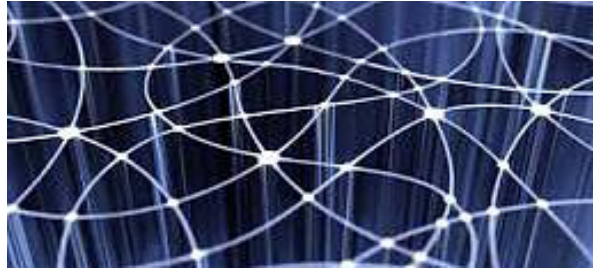


High-performance Signal and Data Processing: Challenges in Astro- and Particle Physics and Radio Astronomy Instrumentation



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The ATLAS readout electronics and timing

The ATLAS detector has been designed to study the proton-proton collisions produced by the Large Hadron Collider (LHC) at CERN. The trigger based data acquisition system of ATLAS is composed by a first level with detector specific hardware followed by a common software trigger. The events selected by the first level of trigger are transmitted to the off-detector electronics where the data is reconstructed and transferred to the common High Level Trigger system. A series of upgrades are scheduled for the next ten years to increase the LHC instantaneous luminosity. The overall readout architecture and the trigger structure is being revised to cope with the new LHC parameters. This presentation summarizes the readout electronics of the different ATLAS sub-detectors in the present system and the evolution for the ATLAS upgrade. It will include a detailed description of the custom front-end and back-end electronics, the signal reconstruction algorithms and the different timing procedures used to synchronize the acquired data.

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