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Development of the ATLAS Liquid Argon Calorimeter Readout Electronics for the HL-LHC

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To meet new TDAQ buffering requirements and withstand the high expected radiation doses at the high-luminosity LHC, the ATLAS Liquid Argon Calorimeter readout electronics will be upgraded. Developments of low-power preamplifiers and shapers to meet low noise and excellent linearity requirements are ongoing in 130nm CMOS technology. In order to digitize the analogue signals on two gains after shaping, a radiation-hard, low-power 40 MHz 14-bit ADCs is developed in 65 nm CMOS. The signals will be sent at 40 MHz to the off-detector electronics, where FPGAs connected through high-speed links will perform energy and time reconstruction through the application of corrections and digital filtering. The data-processing, control and timing functions will be realized by dedicated boards connected through ATCA crates. Results of tests of prototypes of front-end components will be presented, along with design studies on the performance of the off-detector readout system.

First author

Sandra Leone

Email

sandra.leone@cern.ch

Collaboration / Activity

ATLAS Collaboration

Primary author: KETABCHI, Sana (Toronto)

Co-author: ATLAS COLLABORATION

Presenter: KETABCHI, Sana (Toronto)

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