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

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In order to withstand the high expected radiation doses at the High-Luminosity LHC, the ATLAS Liquid Argon Calorimeter readout electronics will be upgraded.

This includes the development of custom preamplifiers and shapers meeting low noise and excellent linearity in 65 nm and 130 nm CMOS technologies to meet these requirements, a new ADC chip with two gains over a dynamic range of 16 bits and 11 bit precision and new calibration boards with excellent non-linearity and non-uniformity between all of the 182468 calorimeter channels are developed.

New ATCA compliant signal processing boards equipped with FPGAs and high-speed links receiving the total of 345 Tbps of detector data at 40 MHz and performing energy and time reconstruction as well as a new timing and control system connecting to it are also being developed.

Test results of the latest versions of the aforementioned on- and off-detector components as well as the latest firmware development will be presented.

Author: LARSON, Lauren (University of Texas at Austin (US))

Presenter: LARSON, Lauren (University of Texas at Austin (US))

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