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

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The high-luminosity LHC will provide 5-7 times higher luminosites than the orignal design. An improved readout system of the ATLAS Liquid Argon Calorimeter is needed to readout the 182,500 calorimeter cells at 40 MHz with 16 bit dynamic range in these conditions. Low-noise, low-power, radiation-tolerant and high-bandwidth electronics components are being developed in 65 and 130 nm CMOS technologies. First prototypes of the front-end electronics components show good promise to match the stringent specifications. The off-detector electronics will make use of FPGAs connected through high-speed links to perform energy reconstruction, data reduction and buffering. Results of tests of the first prototypes of front-end components will be presented, along with design studies on the performance of the off-detector readout system.

Secondary topics

Ionization, Noble liquids

Applications

Primary topic

Front-end readout and trigger

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