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# Upgrade for the ATLAS Tile Calorimeter readout electronics at the High Luminosity LHC

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The Tile Calorimeter (TileCal) is the hadronic calorimeter covering the most central region of the ATLAS experiment at LHC. I consists of about 1000 channels.
The main upgrade will occur for the High Luminosity LHC phase (phase 2) scheduled around 2022. The upgrade aims at replacing the majority of the on- and off-detector electronics so that all calorimeter signals are directly digitized and sent to the off-detector electronics in the counting room. This will be done with minimum latency and maximum robustness. It will provide maximum information to the first level of the calorimeter trigger to improve the trigger efficiency as required to cope with the increased luminosity.
Three options are presently being investigated for the front-end electronic upgrade. The first option is an improved version of the present system built using discrete components. The second alternative is based on the development of a dedicated ASIC, which will provide most of the functionality including the digitization. The third alternative is the development of a new version of the "QIE", a custom integrated circuit that incorporates a 4-range current integrator, on-board digitization, and timing. A demonstrator prototype read-out for a slice of the calorimeter with most of the new electronics, but also compatible with the present system, is planned to be inserted in ATLAS already in phase 0. The presentation gives an overview of the proposed design and summarize the status of the project.

## for the collaboration

On behalf of the ATLAS Tile Calorimeter group

**Presenter:** CARRIO ARGOS, Fernando (University of Valencia)

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