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The Diagnostics and Verification System for the Tile Calorimeter Trigger and Data Acquisition framework of the ATLAS Detector

During the maintenance period of the Front-End electronics of the Tile Calorimeter of the ATLAS detector, one has to quickly assess their state, first by confirming existing problems, and secondly by assessing the validity of the repairs. The Diagnostics and Verification System (DVS) tests are composed of checks that are used to verify the functionality of the Tile front-end (FE) electronics and is used mostly during the maintenance period. DVS implements similar tests to the Mobile Integrity Check (MobiDick) in an embedded system. MobiDick is the first level tests after repairs, and DVS follows at the second level when the module is inserted back into position and connected to the TDAQ system. The current high-precision DVS tests available for TileCal are run from the command-line using two separate programs executed on separate computers. This is not efficient and is mostly understood by Tile Calorimeter Data Acquisition (DAQ) experts. Sometimes after a drawer repair, negative feedback comes one day later from the offline team about specific errors that both DVS and MobiDick are not designed to detect. More DVS tests should be implemented to be able to improve the quality assurance procedure after the repairs. In particular, a stuckbit test should be implemented, which is currently not available in DVS but it is in MobiDick. DVS tests are designed similar to MobiDick tests but are carried out later to assess the Tile FE electronics later on after the maintenance period. However, DVS should continue to be developed to further integrate online and offline data quality validation.

Apply to be
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Yes

Level for award
 (Hons, MSc,
   PhD, N/A)?

MSc

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