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iRPC FEB cooling system

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In view of the High Luminosity upgrade of CERN LHC, the forward CMS Muon spectrometer will be extended with two new stations of improved Resistive Plate Chambers (iRPC), covering the pseudorapidity range from 1.8 to 2.4. A new Front-End-Board (FEB) is designed to readout iRPC signals with a very low threshold and a Time Digital Converter (TDC) embedded into a Cyclone V INTEL FPGA. In contrast to the previous RPC boards, this one produces 22 W of heat in a rather confined space that needs to be carefully evacuated. A cheap and robust cooling system was designed based on a copper plate and water cooling. This system was first simulated with a CFD package, Ansys Fluent and then optimized with thermal measurements. In this poster the system and its prominent features are described. A quantitative comparison between the experimental measurements in the laboratory with the simulation is provided proving the robustness of the former.

Author: KEMULARIA, Otari (Georgian Technical University (GE))

Presenter: KEMULARIA, Otari (Georgian Technical University (GE))

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