



Contribution ID: 35

Type: not specified

Challenges on the experimental validation of Finite Volume Model thermal simulation of Modules for the CMS Phase II Outer Tracker

Wednesday 8 June 2022 15:45 (30 minutes)

The new Outer Tracker of CMS for the Phase-II upgrade will host about 13'000 Modules which will be cooled by two-phase Carbon Dioxide (CO₂) flowing at a temperature of around -35°C at the evaporator. Given the mechanical and geometrical complexity of the Modules, simulations based on the Finite Volume Model have been extensively used in the R&D process for evaluating their thermal performance and comparing different design alternatives. Due to the huge number of Modules and the critical environment where they will be supposed to operate, simplifications were inevitably made in the definition of the boundary conditions, generally considering the worst-case scenario as a criterion choice between simulation alternatives. From this circumstance, it derives the need to compare numerical results with data coming from real tests on functional modules, to be executed on experimental apparatuses trying to recreate the environmental conditions of the new Tracker. A critical analysis between the boundary conditions modelled in the simulations and the real ones observed in experimental contexts is given, highlighting how these affect the comparison of results.

Authors: BALDINELLI, Giorgio (University of Perugia); BIANCHI, Francesco (Universita e INFN, Perugia (IT)); TURRIONI, Cristiano (Universita e INFN, Perugia (IT))

Presenter: TURRIONI, Cristiano (Universita e INFN, Perugia (IT))

Session Classification: Coffee and poster session