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Physics object performance of the FCC-hh calorimeter system

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The feasibility of a future proton-proton collider (FCC-hh), will deliver collisions at a center of mass energies up to 100 TeV and unprecedented instantaneous luminosity (L=30^{34}), resulting in extremely challenging radiation conditions up to a maximum of 5e18 neq/cm2 and dose up to 5 GGy in the forward calorimeters (up to $|\eta|$=6) and up to 1000 simultaneous proton-proton interactions per bunch-crossing. By delivering an integrated luminosity of few tens of ab-1, the FCC-hh will provide an unrivalled discovery potential for new physics. Requiring high sensitivity for resonant searches at masses up to tens of TeV imposes strong constraints on the design of the calorimeters. Resonant searches in final states containing jets, taus and electrons require both excellent energy resolution at multi-TeV energies as well as outstanding ability to resolve highly collimated decay products resulting from extreme boosts. In addition, the FCC-hh provides the unique opportunity to precisely measure the Higgs self-coupling in the di-photon and b-jets channel. Excellent photon and jet energy resolution at low energies as well as excellent angular resolution for pion background rejection are required in this challenging environment. In this talk we will briefly review the electromagnetic and hadronic calorimeter current design and requirements (granularity, energy resolution, acceptance,$\cdots$) and discuss the expected performance of the physics objects based on calorimeter reconstruction. We will then examine the impact of the object performance on the final sensitivity of the relevant benchmark physics analyses.

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