FCC Week 2025



Contribution ID: 23

Type: (a) Talk abstract only

FCC-hh cryogenics update for 1.9 K and 4.5 K options

Tuesday 20 May 2025 11:39 (21 minutes)

The cryogenic system design of FCC-hh has matured during the Feasibility Study with the evolution of the magnets operation parameters, from a Nb3Sn @ 16 T version, updated from the CDR, towards a 14 T version of the same magnet technology in the so-called "F14 scenario", while even envisaging a 4.5 K option. This presentation will focus on the FCC-hh machine, emphasizing on the latest cryogenic layouts foreseen at this stage of the study for the 1.9 K and the 4.5 K options operating in the F14 scenario. It will address the impacts of the optimization of the main FCC-hh machine parameters, starting from the cryogenic infrastructure with the new implementation of the cryoplants, down to the related cryogenic distribution system sizing, based on the refinement of the cryogenic heat loads updated from the CDR to the F14 scenario in both 1.9 and 4.5 K options. Associated helium inventory management and resulting electrical power consumption will be discussed. New magnets cooling scheme proposal for the 4.5 K option will only be mentioned and is not part of this talk.

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Session Classification: Technical Infrastructure

Track Classification: Technical Infrastructures