Contribution ID: **462** Type: **Presentation**

Development of a Cryogenic System for the FCC-hh Inner Triplets Cold Mass Cooling

Wednesday 26 June 2019 11:00 (20 minutes)

The final beam-focussing quadrupoles, the so-called inner triplets, are located immediately before the interaction points and receive high specific heat loads with an unequal spatial distribution. Despite the installation of a tungsten shield which absorbs the major part of the emitted photons at an intermediate temperature level of about 50 K, the remaining radiative power falling on the cold mass exceeds the specific heat load of the beam-bending sections by a factor of up to 102 and has to be extracted at superfluid helium temperature level (1.9 K). Given the peculiar heat load distribution, the application of well-established cooling concepts is incompatible for the FCC-hh inner triplets with its magnetic lattice structure and the cold mass design.

In this talk a rough overview of the current inner triplets design and the cryogenic requirements is given, followed by the explanation of the difficulties and disadvantages for common cryogenic systems operating at 1.9 K due to the high and non-uniform heat load. In the end, developments of the inner triplet design and the cryogenic system are discussed to assure reliable cooling and operation.

Authors: DELIKARIS, Dimitri (CERN); TAVIAN, Laurent Jean (CERN); KOTNIG, Claudio

Presenter: KOTNIG, Claudio

Session Classification: Infrastructure and operation

Track Classification: Technical infrastructure & operation