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Possible Designs of HOM Couplers for Superconducting 400 MHz RF Cavities

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The Future Circular Collider (FCC) is one possible future successor of the Large Hadron Collider (LHC) at CERN. The proton-proton collider center-of-mass collision energy is set to 100 TeV with a beam current of 0.5 A. To achieve this energy a stable acceleration is critical and therefore higher order modes (HOM) need to be damped. HOM dampers, further characterized as couplers, need to fulfill several criteria to be efficient. As a first property the couplers should assure a longitudinal impedance of higher order modes of below 10 k Ω . Furthermore, the loaded Q-factor should be below 1000 and the corresponding R/Q value should be in the range of 10 Ω or lower. Besides the Hook-type and Probe-type HOM coupler two additional designs were simulated. The recent results of the different couplers attached to a superconducting 400 MHz RF cavity will be presented.

Author: PENTRY, Nils**Co-author:** Mr PODLECH, Holger (Goethe University Frankfurt)**Presenter:** PENTRY, Nils**Session Classification:** SRF**Track Classification:** Superconducting RF & associated technologies