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Accelerating cavity and HOM coupler design study for the Higgs and top operation modes of FCC-ee

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The design study for the future circular collider (FCC) includes an electron-positron collider with beam energies ranging from 45.6 to 182.5 GeV in order to study the properties of the Z, W and H bosons and the top quark with high precision. In order to accelerate the particles to the required energy, an RF system is needed to provide the accelerating voltage for the four machine setups. Designing a single RF system that can serve for all four scenarios is not efficient. Generally speaking, these four energy setups can be divided into two categories: high current setups that are characterized by low voltage and high current, i.e. Z and W, and high energy setups that are characterized by low beam current but high accelerating voltage, i.e. H and tt. In this contribution, we will present the design of an accelerating cavity and higher order mode couplers, considering mainly the requirements of the H and tt operation modes of FCC-ee.

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