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Beam-cavity interaction challenges for the FCC-ee

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The beam-cavity interaction and longitudinal instabilities may affect the choice of the RF system for high-current storage rings. In particular, beam loading, higher-order mode power losses, and coupled-bunch instabilities are the main performance limiting factors which must be considered in the early design stage. Operating the FCC-ee at the Z energy will be challenging due to the high beam current and a large number of bunches. In this contribution, the effects are quantified and compared for two different cavity types: 400 MHz single-cell and 600 MHz two-cell slotted waveguide elliptical cavities.

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