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Design of an online adjustable waveguide coupler for the TM₀₂₀-mode cavity of proposed STCF

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The Super Tau-Charm Facility (STCF) project plans to use 12-15 TM₀₂₀-mode cavities for each collider ring to compensate for the beam energy loss. Each cavity is designed to provide a voltage of 0.5 MV and a power of 250 kW for the beam. Therefore, an online adjustable waveguide coupler with a power capacity of CW 300 kW has to be developed for each cavity. This input coupler has a waveguide size the same as the half-height WR1500. The coupling between the cavity and the half-height WR1500 is realized by a rectangle hole with blending. This paper presents the electromagnetic design, the multipacting simulation, and the thermal and stress analysis of the input coupler in detail.

Footnotes

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