

Accelerator design and R&D efforts for Super Tau-Charm Facility

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Super Tau-Charm Facility (STCF) was proposed as a third-generation circular electron-positron collider of 2-7 GeV (CoM) and $5 \times 10^{34} \text{ cm}^{-2} \text{ s}^{-1}$ (luminosity), aiming to explore charm-tau physics in the next decades. This presentation will introduce the accelerator design and R&D efforts for STCF. Under the financial support of the local provincial and national funding agencies, the STCF accelerator team is working on the conceptual design of the accelerator. The accelerator consists of an injector and two collider rings. The injector will provide full-energy electron and positron beams for top-up injections. The collider rings with typical third-generation features are designed to have an extremely low beta ($< 1 \text{ mm}$), a large Piwinski angle (> 10) and a high beam current (2 A) with the Crab-Waist collision scheme. Several challenges have been identified for intense study and R&D efforts, e.g. a very short Touschek lifetime of less than 300 s and twin-aperture superconducting magnets at IR.

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