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CEPC superconducting RF system EDR design and R&D

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The CEPC (Circular Electron-Positron Collider) is a 100-kilometer circular collider designed to operate at center-of-mass energies ranging from 90 GeV to 360 GeV, with the primary physics program targeting Z and W bosons, Higgs bosons, and top-quark pair (ttbar) production. Following the publication of its Technical Design Report (TDR) in 2024, the project has now entered the Engineering Design Report (EDR) phase. This contribution outlines the EDR design of the CEPC's Superconducting Radiofrequency (SRF) system, along with the associated R&D challenges and recent progress. During the EDR phase, the SRF system's primary objective is to develop SRF cryomodules for the first operational stage of the CEPC. A key milestone will be a full-scale 650 MHz cryomodule prototype for the collider ring to validate the stable operation using an 800 kW continuous-wave (CW) klystron and the Low-Level Radio Frequency (LLRF) control system. Additionally, preparations for mass-production of 650 MHz and 1.3 GHz cavities and cryomodules are underway aligned with China's ongoing large-scale SRF projects.

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Yes

Footnotes

Funding Agency

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