

Upgrade of Vertical Test Stand for 650 MHz Superconducting RF Cavities for CEPC

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Hundreds of 650 MHz superconducting radio-frequency (SRF) cavities with ultrahigh intrinsic quality factor (Q_0) and accelerating gradient (Eacc) will be adopted for CEPC, which are obtained during vertical test at 2.0 K. In order to meet the demand for low-temperature testing of materials and bulk testing of SRF cavities, the vertical test stand of Platform of Advanced Photon Source (PAPS) was upgraded accordingly with cryogenic refrigeration and microwave RF systems. The upgraded system provides three vertical test dewars, each providing 100W thermal load at 2K for superconducting cavity testing and operation. It supports five 650MHz superconducting cavities to be tested at one time by cooling down, and is equipped with microwave test system, T-mapping test system, temperature, flux probe and radiation detector and other related test equipment. In addition, the digital self-excitation scheme is upgraded and used in the microwave test, and the vertical test accuracy is considered to realize real-time error analysis and display.

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