

The 2024 International Workshop on the High Energy Circular Electron Positron Collider

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Design and high power test of 650MHz/800 kW high efficiency klystron for CEPC

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The 650MHz/800kW CW klystron is an important component of the RF power source for the Circular Electron Positron Collider (CEPC). In order to reduce the energy demand and operating costs of the CEPC, the high efficiency klystron is developed at Institute of High Energy Physics, which is aiming to increase the efficiency of the klystrons to above 80%. In March 2020, the first prototype klystron, using a second harmonic cavity, achieved output efficiency of around 65%. To further increase the efficiency of the klystrons to around 75%, the second prototype klystron adopts a combination of lower perveance and the core stabilization method (CSM). Currently, this prototype klystron has been finished high power test. The test results show that the output power and efficiency have reached 803kW and 78%, respectively.

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