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Progress of CSNS-II SRF system

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The China Spallation Neutron Source (CSNS) is the fourth pulsed accelerator-driven neutron source in the world. Meanwhile, it is one of the core large-scale scientific facilities of the Guangdong-Hong Kong-Macao Greater Bay Area Comprehensive National Science Center. The planned China Spallation Neutron Source Phase II (CSNS-II) started construction in 2024 and is scheduled to be completed in July 2029. To achieve a beam power of 500 kW for target station, the beam energy of the linear accelerator needs to be increased to 300 MeV. Therefore, a superconducting linear accelerator composed of two types of superconducting cavities, namely 324 MHz double-spoke cavities with β0 is 0.5 and 648 MHz 6-cell elliptical cavities with βg is 0.62, will be added after the Drift Tube Linac (DTL). We have completed the R&D of a prototype double-spoke cavity cryomodule and two prototype elliptical cavities. The test results showed that the maximum gradients of the two double spoke cavities at a pulse width of 4 ms and a repetition frequency of 25 Hz was 15.2 MV/m during horizontal test, while the maximum gradient of the elliptical cavity reaches 25.7 MV/m during vertical test. Both type cavities test results indicate that the design and post processing are very reliable, the mass production of superconducting cavities, couplers, tuners, and cryostats has been initiated, with plans to complete the manufacturing of all cryomodules by early 2027.

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Yes

Footnotes

Funding Agency

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