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Design and testing of high-power C-band dry load for the Shanghai Soft X-ray Free-Electron Laser Facility

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The main accelerator of the Shanghai Soft X-ray Free-Electron Laser (SXFEL) facility utilizes C-band traveling wave accelerator tubes to accelerate electrons. At the end of the traveling wave accelerator tube, a load is required to absorb the residual power. To this end, a high-power stainless steel load operating at a frequency of 5712 MHz has been developed. The microwave model of the load was designed using simulation methods, optimizing its microwave parameters. And by combining electromagnetic simulation with thermodynamic simulation, the thermal effects during the operation of the load were calculated, and the structure of the water cooling channels was designed. The mechanical design and manufacturing of the load were completed, and two tests were conducted using a vector network analyzer before and after argon arc welding. The test results met the usage standards.

Footnotes

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