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Design of a fully 3D-printed 350MHz-CH-structure

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This study presents the design and fabrication of a fully 3D-printed Crossbar H-mode (CH) cavity operating at 350 MHz, optimized for continuous-wave (CW) operation. The cavity is manufactured using a 1.4404-grade stainless steel additive manufacturing process, followed by electrochemical polishing and galvanic copper plating to enhance surface conductivity and reduce power losses. The structure will be tested at the FRANZ accelerator in Frankfurt with a 2 MeV proton beam. The accelerating gradient is designed to achieve approximately 1 MV/m, limited by the available RF-power-amplifier of 2 kW. This research demonstrates the feasibility of integrating additive manufacturing with high-frequency accelerator technology for cost-effective and robust cavity production.

Footnotes

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