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Improvements to 4-rod RFQs with additive manufacturing processes

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The institute of applied physics (IAP), university of Frankfurt, has been working for years on the development of increasingly powerful 4-Rod RFQ accelerators for hadron acceleration. The need for such accelerators has increased significantly in the recent past, as accelerator-driven neutron sources are becoming increasingly important following the closure of various test reactors. High beam currents, particle energies and operational stability are often required from those LINACs. In order to meet these requirements, the copper structure of the RFQ is to be manufactured using a new type of pure copper 3D printing in order to be able to introduce optimized cooling channels inside the copper parts. Comprehensive multiphysics simulations with ansys, cst and autodesk CFD will first be carried out to evaluate the operational stability and performance. In addition, it will be clarified whether the printed copper fulfills the necessary vacuum and conductivity requirements after CNC processing, or whether galvanic copper plating should be carried out.

Footnotes

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Region represented

Europe

Primary author: STORCH, Julius-Stephan (Goethe Universität Frankfurt)

Co-authors: PODLECH, Holger (Goethe Universität Frankfurt); KÜMPEL, Klaus (Goethe Universität Frankfurt); BRAUN, Peter (Goethe Universität Frankfurt)

Presenter: STORCH, Julius-Stephan (Goethe Universität Frankfurt)

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