

Development of a compact RF coupler utilizing additive manufacturing

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Additive manufacturing (AM) has established itself as a powerful tool for rapid prototyping and the production of complex geometries. For use in a 433 MHz IH-DTL cavity, a CF-40 coupler is being developed that is manufactured from pure copper using a 3D printing process and has a water cooling concept that cannot be realized using conventional methods. The coupler consists of a ceramic window cooled on both sides, an outer conductor with spiral cooling channels and a cooled inner conductor. Thanks to its modular design, the individual components can be easily replaced. The ideal transmission is frequency-dependent and was adjusted by fine-tuning the inner conductor structure in CST-Simulations. A prototype made of aluminum was built for verification purposes.

Footnotes

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