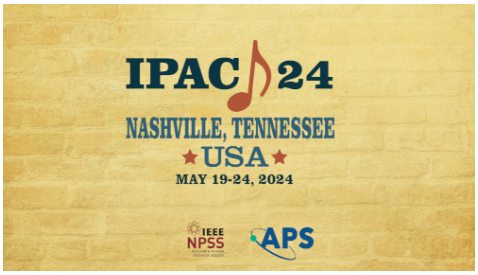

Contribution ID: **531** Contribution code: **THPS67** Type: **Poster Presentation**

Support structures and their removal improve performance of additively manufactured RF cavities

Thursday, 23 May 2024 16:00 (2 hours)

The enormous potential of additive manufacturing (AM), in particular laser powder bed fusion (L-PBF), for the manufacturing of normal-conducting radio frequency cavities (cavities) has already been demonstrated. However, the required geometrical accuracy for GHz TM010 cavities is currently only achieved using: a) co-printed support structures, which are however difficult to remove for small GHz cavities. b) Avoidance of downskin angles alpha<40°, which in turn leads to a cavity geometry with reduced shunt impedance. We have developed an L-PBF-based manufacturing approach to overcome these limitations. To enable arbitrary geometries, co-printed support structures are used that are designed in such a way that they can be removed after printing by electrochemical post-processing. At the same time, the surface roughness is reduced, and thus the quality factor maximized. The fabrication approach is evaluated on a 3 GHz TM010 single-cavity geometry printed entirely from high-purity copper.

Footnotes

Funding Agency

Paper preparation format

LaTeX

Region represented

Europe

Primary author: MAYERHOFER, Michael (Universitaet der Bundeswehr Muenchen)

Co-author: DOLLINGER, Guenther (Universitaet der Bundeswehr Muenchen)

Presenter: MAYERHOFER, Michael (Universitaet der Bundeswehr Muenchen)

Session Classification: Thursday Poster Session

Track Classification: MC7: Accelerator Technology and Sustainability: MC7.T35 Advanced Manufacturing Technologies for Accelerator Components