



Contribution ID: 28

Type: not specified

Prototyping the Nb coating of the copper Wide Open Waveguide Crab Cavity (WOWCC) for FCC-hh

Thursday, 1 July 2021 14:15 (25 minutes)

The implementation of suitable crab cavities is an important milestone for the SRF activities in the feasibility study for a hadronic FCC. The proposed Wide Open Waveguide design [1,2] achieves bunch tilting by deflecting particles in transverse TE-111 like field, optimized between two tapered ridges with a mushroom-shaped cross-section. Its eponymous large apertures furthermore reduce shunt impedances and the confinement of residual higher order modes. Considering the given requirements of geometric precision, heat transport and project scale, a niobium coated copper cavity was chosen.

Here, we will present the current state of the dedicated coating system R&D. Numerical studies of the magnetron plasma and sputtering process have established the use of 6 cylindrical cathodes along the cavity as sputtering targets. Sample coatings performed on a reduced 3-cathode set-up achieved a significant improvement of coating quality through High Impulse Magnetron Sputtering [3,4]. More recently, the impact of the simultaneous use of multiple cathodes on the coating characteristics and heat loads has come under investigation, to optimize the specific coating process steps. In parallel, the scale-1 coating system design is being finalized, aiming for a first coating of a WOWCC prototype early next year.

- [1] A. Grudiev, Proceedings of SRF 2015
- [2] K. Papke et al, Phys. Rev. Accel. Beams 22, 072001, 2019
- [3] F. Avino et al, Plasma Sources Sci. Technol. 28, 01LT03, 2019
- [4] F. Avino et al, Thin Solid Films 706, 138058, 2020

Primary authors: MANKE, Fabian (CERN); AVINO, Fabio (École polytechnique fédérale de Lausanne (EPFL) - Switzerland); GRUDIEV, Alexej (CERN); PEREZ FONTENLA, Ana Teresa (CERN); RICHARD, Thibaut (CERN); SUBLET, Alban (CERN); TABORELLI, Mauro (CERN)

Presenter: MANKE, Fabian (CERN)

Session Classification: SRF

Track Classification: Accelerators: SRF