



Contribution ID: 1598 Contribution code: THPA137

Type: **Poster Presentation**

RF characterisation of laser treated copper surfaces for the mitigation of electron cloud in accelerators

Thursday, 11 May 2023 16:30 (2 hours)

In accelerator beam chambers and RF waveguides, electron cloud and multipacting can be mitigated effectively by reducing the secondary electron yield (SEY). In recent years, it has been established that laser surface structuring is a very efficient method to create a copper surface with SEY close to or even below unity. Different laser pulse durations, from nanoseconds to picoseconds, can be used to change surface morphology. Conversely, the characteristics that minimise the SEY, such as the moderately deep grooves and the redeposited nanoparticles, might have unfavourable consequences, including increased RF surface resistance. In this study, we describe the techniques used to measure the surface resistance of laser-treated copper samples using an enhanced dielectric resonator with 12 cm diameter sample sizes operating in the GHz range. The quantification basis lies in a non-contact measurement of the high-frequency losses, focusing on understanding the variation of surface resistance levels depending on the specifics of the treatment and possible post-treatment cleaning procedures.

Funding Agency

Footnotes

I have read and accept the Privacy Policy Statement

Yes

Primary authors: KRKOTIC, Patrick (European Organization for Nuclear Research); CALATRONI, Sergio (European Organization for Nuclear Research)

Co-authors: ABDOLVAND, Amin (University of Dundee); PEREZ FONTENLA, Ana Teresa (European Organization for Nuclear Research); NEUPERT, Holger (European Organization for Nuclear Research); HIMMERLICH, Marcel (European Organization for Nuclear Research); WACKEROW, Stefan (University of Dundee)

Presenter: PEREZ FONTENLA, Ana Teresa (European Organization for Nuclear Research)

Session Classification: Thursday Poster Session

Track Classification: MC7: Accelerator Technology and Sustainability: MC7.T14: Vacuum Technology