



Contribution ID: 28

Type: Oral

Microscopy investigation on different materials after pulsed high field conditioning and low energy H-irradiation.

Tuesday, 20 September 2022 11:30 (30 minutes)

During operation the LINAC4 RFQ (Radio-Frequency-Quadrupole) is exposed to high electric fields which can lead to vacuum breakdown. It is also subject to proton beam loss that can cause surface modification, including blistering, which can result in reduced electric field handling and an increased breakdown rate. An experimental study has been made to identify materials with high electric field capability and robustness to low-energy proton irradiation. In this presentation we briefly discuss the selection criteria and we analyze these materials investigating their metallurgical properties using advanced microscopic techniques such as Scanning Electron Microscope, Electron Back Scattered Diffraction, Energy-dispersive X-ray Spectroscopy and conventional optical microscopy. The different materials are observed and characterized on a micro and a nano-scale, and are compared before and after irradiation and breakdown testing.

Topic

Primary author: SERAFIM, Catarina (University of Helsinki (FI))

Co-authors: LOMBARDI, Alessandra (CERN); GRUDIEV, Alexej (CERN); PEREZ FONTENLA, Ana Teresa (CERN); SARGSYAN, Edgar (CERN); DJURABEKOVA, Flyura (University of Helsinki); PEACOCK, Ruth (Lancaster University (GB)); CALATRONI, Sergio (CERN); SGOBBA, Stefano (CERN); WUENSCH, Walter (CERN)

Presenter: SERAFIM, Catarina (University of Helsinki (FI))

Session Classification: Experiments & Diagnostics

Track Classification: Experiments