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PULSED DC HIGH FIELD MEASUREMENTS OF IRRADIATED AND NON-IRRADIATED ELECTRODES OF DIFFERENT MATERIALS

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Beam loss occurs in H- RFQs, and has been observed for example in LINAC4 at CERN. To determine if such beam loss can induce breakdown, and to compare the robustness of different materials, tests have been done in pulsed high-voltage DC systems. Cathodes of different materials were irradiated with $1.2E19$ H- p/cm², the estimated beam loss of the LINAC4 RFQ. The irradiated electrodes were tested to observe if the irradiated area had an impact on the breakdown locations. Tests were done using irradiated and non-irradiated electrodes of the same material for comparison. The main differences observed was an increase in the number of breakdowns during the initial conditioning for Cu OFE and TiAl6V4 with little to no difference to the field reached, and significant reductions in achievable field for CuCr1Zr, Ta and Nb.

Topic

Applications

Primary author: PEACOCK, Ruth (Lancaster University (GB))

Co-authors: LOMBARDI, Alessandra (CERN); GRUDIEV, Alexej (CERN); PEREZ FONTENLA, Ana Teresa (CERN); SERAFIM, Catarina (University of Helsinki (FI)); SARGSYAN, Edgar (CERN); BELLODI, Giulia (CERN); BURT, Graeme Campbell (Lancaster University (GB)); CALATRONI, Sergio (CERN); SGOBBA, Stefano (CERN); RAMBERGER, Suitbert (CERN); WUENSCH, Walter (CERN)

Presenter: PEACOCK, Ruth (Lancaster University (GB))

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