Contribution ID: **1604** Contribution code: **THPS060** Type: **Poster Presentation**

Photon stimulated desorption from cryogenic surfaces of high temperature superconductor and amorphous carbon thin films

Thursday 5 June 2025 15:30 (2 hours)

High Temperature Superconductor (HTS) and amorphous Carbon (a-C) thin films, and their combination, are being considered as possible surface coatings for the FCC-hh beam screen (BS) with the aims of reduction of the resistive wall impedance and mitigation of the electron cloud. Along with these required properties, i.e., the high electron conductivity and low secondary electron yield, the Photon Stimulated Desorption (PSD) yield is one of the most essential characteristics in the design and operation of the FCC-hh vacuum systems. For this purpose, a series of the PSD measurements is currently conducted at a dedicated beamline in the KEK Photon Factory, where similar conditions to FCC-hh in terms of the Synchrotron Radiation energies and power density are available. In order to realize a similar cryogenic condition of the BS (40-60 K), the sample container is equipped with a LN2 jacket (77 K) and installed in an insulation vacuum chamber. The conditioning behaviors of the PSD yields as a function of the photon dose are being obtained for uncoated copper and HTS, and a-C coated copper and HTS, and each sample is examined at cryogenic and room temperatures for comparative analysis.

Footnotes

Paper preparation format

Word

Region represented

Asia

Funding Agency

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Session Classification: Thursday Poster Session

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