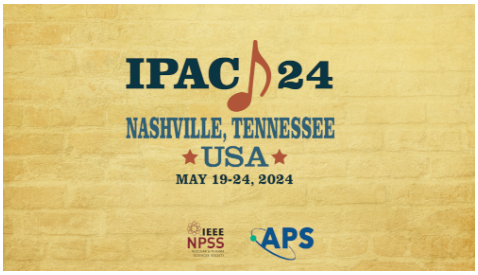

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An experimental study on plasma cleaning of room temperature copper cavity: design and analysis

Thursday, 23 May 2024 16:00 (2 hours)

The development and standardization of in-situ plasma cleaning for superconducting radio frequency (SRF) cavities have a well-established history. This technique has demonstrated efficacy in reducing dark current and electron multiplication, thereby enhancing the acceleration gradient and stability of SRF devices. However, applying in-situ plasma cleaning to normal-temperature copper (NTC) cavities presents a unique challenge due to the absence of defined parameters, processes, and experimental data. Unlike SRF cavities, NTC cavities face difficulty removing surface oxide to increase the work function. Addressing this challenge, Tsinghua University conducted a study to investigate the application of argon-oxygen plasma for the removal of organic matter, gas, and burrs, and argon-hydrogen plasma to reduce copper oxide on NTC cavities specifically. The findings from this research contribute valuable insights that can serve as a guide for the effective implementation of in-situ plasma cleaning in NTC cavities.
This paper is only for experimental results and data analysis. The related plasma physics formulas and COMSOL calculation results will be presented in future papers.

Footnotes

Funding Agency

Paper preparation format

Region represented

Asia

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