

Development of plasma processing of 1.3 GHz superconducting radiofrequency cavities at TRIUMF

Sunday 25 August 2024 16:00 (2 hours)

Superconducting RadioFrequency (SRF) technology is a key component in many particle accelerators operating in a continuous wave, or high duty cycle, mode. The on-line performance of SRF cavities can be negatively impacted by the gradual reduction in the accelerating gradient that can be attained within a reasonable field emission level. Conventional cleaning procedures are both time- and resource-exhaustive as they are done *ex-situ*. As such, *in-situ* techniques are quite attractive. Plasma processing is an emerging *in-situ* method of cleaning which utilizes a mixture of oxygen and an inert gas to chemically remove hydrocarbon-based field emitters through plasma. At TRIUMF's Advanced Rare IsotopE Laboratory (ARIEL), an R&D program is in place to develop plasma processing procedures using fundamental power couplers on 1.3 GHz ARIEL 9-cell cavities. Single cell and multi-cell processing has been performed off-line. The studies involve varying the input parameters and testing the effectiveness of the treatment through RGA analysis. The progress on the developments will be reported.

Footnotes

Funding Agency

Primary author: HEDJI, Daniel (TRIUMF)

Co-authors: KOLB, Philipp (TRIUMF); LAXDAL, Robert (TRIUMF); JUNGINGER, Tobias (TRIUMF); ZVYAGINTSEV, Vladimir (TRIUMF); YAO, Zhongyuan (TRIUMF)

Presenter: HEDJI, Daniel (TRIUMF)

Session Classification: Student Poster Session

Track Classification: MC4: Technology: MC4.8 Superconducting RF