Contribution ID: **105** Type: **Invited Oral Presentation**

Two instabilities related to vacuum chamber of accelerators

Tuesday 4 March 2025 14:50 (30 minutes)

This talk will overview two instabilities in the accelerator's vacuum chamber that are in a boundary between an accelerator lattice design and solutions for beam vacuum design.

Ion induced pressure instability is a threat for positively charged beams. Modelling of this potential problem is essential for a proper vacuum design for its mitigation. The modelling requires knowledge of various disciplines of science: beam dynamics, gas dynamics and surface science. There is a lack of data and analysis of two main parameters for accurate modeling: energy of ions and ion stimulated gas desorption. Experinetal data and modeling results will be reported.

Non-evaporable getter (NEG) coatings are widely used in particle accelerator as a complex solution which addresses a few problems. It is a barrier for gas diffusion from the vacuum chamber material, it reduces photon and electron stimulated desorption by an order of magnitude. It provides a distributed pumping speed, making NEG is the most economical and, in many cases, the only vacuum solution for long and narrow vacuum chambers. However, the RF surface resistance of NEG coating could increase a beam impedance and cause an increase in the beam energy spread. Possible solution to address this problem will be reported.

Footnotes

Funding Agency

I have read and accept the Privacy Policy Statement

Yes

Primary authors: MALYSHEV, Oleg (Science and Technology Facilities Council); MARINOV, Kiril (Science and Technology Facilities Council); SEAL, Daniel (Science and Technology Facilities Council); VALIZADEH, Reza (Science and Technology Facilities Council)

Presenter: MALYSHEV, Oleg (Science and Technology Facilities Council)

Session Classification: Vacuum

Track Classification: WG9 : Vacuum