



Contribution ID: 78

Type: **Poster**

Thu-Af-Po.11-02: Impact of cryogenic system on RF phase stability in RAON SCL3

Thursday 3 July 2025 14:00 (2 hours)

The cryogenic system for accelerator complex for ON-line experiments (RAON), is designed to maintain extremely low temperatures to support superconducting equipment, such as superconducting linear accelerators and low-temperature superconducting magnets. Superconducting RF (SRF) cavities are integral to particle accelerators, where phase stability ensures precise particle acceleration. The cryogenic system, responsible for maintaining ultralow temperatures for superconductivity, can inadvertently introduce instabilities due to thermal or mechanical perturbations. This study investigates how cryogenic systems affect the RF phase stability in superconducting linear accelerators (SCLs). We measured the changes in RF stability caused by the movement of cryogenic valves and variations in external heat input through experiments. By analyzing the interaction between thermal fluctuations, mechanical vibrations, and electromagnetic properties of RF cavities, we aim to provide insights into optimizing cryogenic operations to enhance phase stability.

Author: KIM, Seojeong

Co-authors: Mr LEE, Gyuho (Institute for Basic Science); JO, Hyun Chul (Institute for Basic Science); PARK, Inmyung; Mr SHIN, Jae Hee (Institute for Basic Science); Mr HAN, Jaehak (Institute for Basic Science); Mr KIM, Jinwook (Institute for Basic Science); YOO, Junghyun (Institute for Basic Science); Dr LEE, Min Ki (Institute for Basic Science); Dr KIM, Youngkwon (Institute for Basic Science)

Presenter: KIM, Seojeong

Session Classification: Thu-Af-Po.11 - Cryostats and Cryogenics II