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Commissioning of the first HElmholtz LInear ACcelerators (HELIAC) cryomodule with heavy ion beam

Monday 22 September 2025 12:20 (20 minutes)

The superconducting heavy ion HELmholtz LInear ACcelerator (HELIAC) is designed to meet the needs of the Super Heavy Element (SHE) research and material sciences user programs at GSI in Darmstadt. The HELIAC is planned for construction at GSI in Darmstadt. The beam energy can be varied smoothly between 3.5 and 7.3 MeV/u, with an average current of up to 1 emA and a duty cycle of 100 %. Recently, the first cryomodule CM1, was fully commissioned and tested w/o beam. CM1 comprises three Crossbar H-mode (CH)-type accelerator cavities, a CH-rebuncher, and two superconducting solenoid lenses. Following the commissioning of the cryogenic supply and the RF-systems, successful beam tests were conducted at the end of 2023 and mid of 2024. A helium as well as an argon ion beam was successfully accelerated to the design energy. The beam energy could be varied continuously between 1.3 and 3.1 MeV/u without any significant particle losses being measured in the cryomodule. This contribution covers the construction and commissioning of the first HELIAC cryomodule and the results of the beam test campaign.

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Yes

Footnotes

Funding Agency

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