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Beam commissioning of the first HELIAC cryomodule

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The superconducting heavy ion HELmholtz LInear ACcelerator (HELIAC) is designed to meet the needs of the Super Heavy Element (SHE) research and material science user programs 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. 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 RF-systems, a successful beam test was conducted at the end of 2023. A helium ion beam was successfully accelerated to the design energy of 2.7 MeV/u. 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.

Footnotes

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Primary author: LIST, Julian (Helmholtz Institut Mainz)

Co-authors: BURANDT, Christoph (Helmholtz Institut Mainz); VORMANN, Hartmut (GSI Helmholtzzentrum für Schwerionenforschung GmbH); DZIUBA, Florian (Helmholtz Institut Mainz); PODLECH, Holger (Goethe Universität Frankfurt); MISKI-OGLU, Maksym (GSI Helmholtzzentrum für Schwerionenforschung GmbH); KALLEICHER, Robin (Helmholtz Institut Mainz); LAUBER, Simon (Helmholtz Institut Mainz); YARAMYSHEV, Stepan (GSI Helmholtzzentrum für Schwerionenforschung GmbH); KUERZEDER, Thorsten (GSI Helmholtzzentrum für Schwerionenforschung GmbH); GETTMANN, Viktor (GSI Helmholtzzentrum für Schwerionenforschung GmbH); BARTH, Winfried (GSI Helmholtzzentrum für Schwerionenforschung GmbH); SCHEELER, Uwe (GSI Helmholtzzentrum für Schwerionenforschung GmbH)

Presenter: VORMANN, Hartmut (GSI Helmholtzzentrum für Schwerionenforschung GmbH)

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