



Superconductivity for
Sustainable Energy Systems
and Particle Accelerators



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Status and Perspectives of the HELIAC-Project

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The linear accelerator HELIAC will provide heavy ions with particle energies of 3.5 MeV/u to 7.6 MeV/u ($A/Z = 6$) at the GSI Helmholtzzentrum für Schwerionenforschung. Thanks to superconducting radio-frequency technology, it will be able to deliver high average beam currents in continuous-wave mode.

The radio-frequency resonators of the so-called Cross-bar H-mode type are being developed in cooperation with the IAP of Goethe University Frankfurt. The suitability of these resonators in principle for ion beam acceleration was successfully demonstrated in an earlier phase of the project. In the current, advanced demonstration stage an extended beam test with a first fully equipped series cryomodule is to take place shortly at GSI. The infrastructure for this has been created in recent years. In addition to setting up a radiation-shielding area with a link to the existing 4 K helium liquefier on site, this also includes vital preparations at the Helmholtz Institute Mainz. There, the superconducting resonators were tested for their performance one at a time and a spacious ISO-class 4 clean room providing the high-purity environment required for the adequate assembly of superconducting RF structures was commissioned.

This talk will present the current status of the project and recent activities, as well as the design of the complete HELIAC accelerator.

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