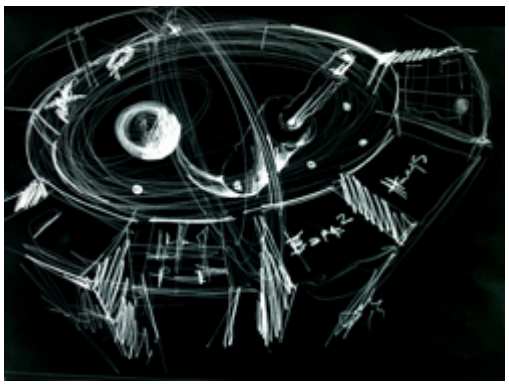
An ion trap facility for experiments with highly-charged heavy ions

Results in Brief

Final design parameters for new particle decelerator

Researchers under the umbrella of the high profile HITRAP project successfully developed a particle decelerator for use in the large accelerator facilities of Europe.

INDUSTRIAL TECHNOLOGIES



© Shutterstock

Several well known particle physics research facilities are located in Europe. Funding from the HUMAN POTENTIAL Programme was set aside to further develop this infrastructure. For instance, the goal of the HITRAP project was to establish a laboratory dedicated to trapping highly charged heavy ions.

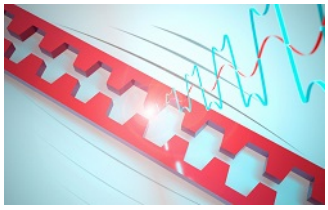
The research consortium included nine partners from seven different EU Member States and was led by GSI Helmholtzzentrum für Schwerionenforschung GmbH in Germany. The design of several important components of the HITRAP decelerator constituted an important project deliverable.

Beam dynamics calculations were performed from the Experimental storage ring (ESR) through the cooler trap, including the re-buncher, the Interdigital H-mode (IH) structure and the Radio-frequency quadrupole (RFQ). Matching the phase spread from ESR to IH-structure was enhanced by incorporating a Double drift re-buncher (DDB) while a low energy de-buncher helped improve injection efficiency into the

HITRAP cooler trap.

The result was a system capable of decelerating 70\;% of the particles drawn from storage. Magnetic quadrupole lens data, three-dimensional CAD drawings and other essential design parameters were assembled in order to facilitate the ensuing tender procedures. The completion of the final design of a new particle decelerator is certain to contribute to extending Europe's legacy in particle physics.

Discover other articles in the same domain of application



A nanoscale device that couples light and mechanical motion has quantum computing potential

20 August 2018

Project Information

HITRAP

Grant agreement ID: HPRI-CT-2001-50036

Project website

Project closed

Start date
1 November 2001

End date
31 October 2005

Funded under
Programme for research, technological development and demonstration on "Improving the human research potential and the socio-economic knowledge base" (1998-2002)

Total cost
€ 1 899 956,00

EU contribution
€ 1 899 956,00

Coordinated by
GESELLSCHAFT FUER SCHWERIONENFORSCHUNG MBH, DARMSTADT
Germany

This project is featured in...

RESEARCH*EU MAGAZINE

Last update: 1 March 2010

Permalink: https://cordis.europa.eu/article/id/85342-final-design-parameters-for-new-particle-decelerator