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An ion beam facility for HCI-based analysis and materials research

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Abstract

Highly charged ions (HCIs) are a promising tool for the production of structures at a nanometer length scale as well as for surface analysis. We present a room-temperature EBIT (Electron Beam Ion Trap) that produces ions such as Ar^{18+} , Xe^{44+} and Ir^{67+} . In order to study the physics of the interaction processes, a new ion beam facility has been designed. The HCIs can be separated according to their mass to charge ratio with acceleration, but also with deceleration providing projectiles with kinetic energies ranging from 10 eV times q to 40 keV times q . A beam spot size of some micrometers can be achieved using suitable apertures. The beam can also be swept over an area of about 1 cm^2 .

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