A NEW ION BEAM FACILITY FOR SLOW HIGHLY CHARGED IONS

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Abstract

A new ion beam facility for slow highly charged ions is presented that will provide low and medium energetic highly charged ions. An Electron Cyclotron Resonance (ECR) ion source delivers high currents of low and medium charged ions whereas very highly charged ions at lower ion currents are supplied by an Electron Beam Ion Trap (EBIT). The new ion beam facility will provide an experimental environment for basic research in atomic and solid state physics, as well as applied research in areas such as surface engineering, nanostructuring and nanobiotechnology.

ECR ion source and very highly charged ions at lower ion currents from an EBIT.

SET-UP OF THE TWO-SOURCE-FACILITY

The extraction of ions out of a plasma requires extraction voltages in the range of 10 to 100 keV. In order to reduce their kinetic energy the ions undergo a deceleration after selection of the required charge to mass ratio.

ECR ion sources as well as EBIT devices are producing ions with different charge states q by electron impact ionization. During the ionization process multiple electron-