

Status report of the charge breeder upgrade

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The REXEBIS charge breeder provides the HIE-ISOLDE linac with highly charged ions such as $2 < A/q < 4.5$. Only for lighter ions the low A/q -values can be obtained (fully stripped ions to reachable $Z=20$), partly because of the limited electron beam energy, but also due to the limited electron current density.

As the electron cooling time is inversely proportional to the square of the ion charge, higher charge states out of the breeder are of interest. Likewise the ion storage time benefits from higher charges as the electron stripping cross-section is reduced. Finally, and most challenging, some of the experiments requests fully stripped ions, or Li/Na-like atomic configuration for the very heavy $A \sim 200$ ions. For these reasons an upgrade of the REXEBIS charge breeder would be of interest.

We are presently pursuing two paths to attain this goal. In a collaboration with Brookhaven National Laboratory we are developing and testing a very high current, high current-density and high energy electron-beam-gun (HEC2). This would be installed in a new 5 T magnet. Since a few months we are also investigating the possibility of producing a scaled-down version of this gun to be installed in the present REX solenoid.

The latest results from these investigations will be discussed.

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