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Status and future prospects of the PHOENIX ECR Charge Breeder

Electron Cyclotron Resonance Ion Sources (ECRIS) are used as charge breeders (CB) to increase the charge state of Radioactive Ion Beams (RIB). ECRIS CB can easily capture and multiionize large intensities of incoming $1+$ RIB; but the operating pressure of the plasma and the plasma interaction with the chamber wall generate ion beam background which can spoil the RIB signal. As a consequence, a high mass resolution is required downstream to separate the signal from the background. In order to facilitate and enhance the ECRIS CB usage, the LPSC team is committed to reduce the ion beam background from ECR charge breeder, increase the production of high charge state and improve $1+N+$ RIB conversion efficiencies. The development plan to reach such goals is presented, consisting in the design of a modified PHOENIX CB equipped with a large plasma chamber, an improved magnetic confinement, an improved vacuum and a rationalized material use to reduce condensable contaminant elements as much as possible.

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