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## Focusing of highly charged ion beams using Gabor-lenses

*Tuesday, 9 May 2023 16:30 (2 hours)*

A Gabor-lens is an ion optical device using the electric self-field of a stable confined electron column providing the focusing strength. This lens type was investigated in detail and it was shown that it is possible to use it in a LEBT for intense heavy ion beams. The homogeneous electron density results in linear focusing forces and provides space charge compensation of the beam. On the other hand it is not clear, how the charge state changes when a highly charged ion beam passes the pure electron plasma confined in a Gabor-lens. Therefore, an experiment was designed, which enables the possibility to transport an 15keV Ar<sup>8+</sup>-beam through a Gabor-lens and estimate the collisional three-body (e<sup>-</sup>-e<sup>-</sup>-ion) recombination to lower charge states. A variation of the relative velocity of the beam with respect to the electron plasma was performed and it was possible to measure the electron density at the same time. Experimental results are presented and future strategies for the transport of highly charged intense ion beams are discussed.

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### Footnotes

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Yes

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