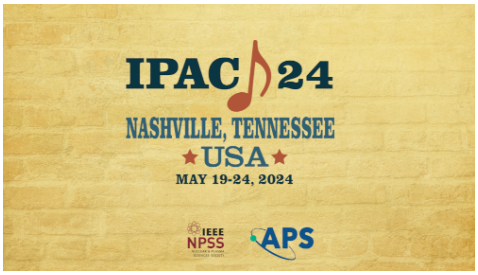

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Development of a de-focusing space charge lens for positive ion beams

Monday, 20 May 2024 16:00 (2 hours)

Space charge lenses are ion-optical devices that focus an ion beam by the intrinsic electric field of confined non-neutral plasmas, for example electron clouds. This was first proposed by Dennis Gabor in the year 1947 and is therefore also known as Gabor-lenses. Previous studies have shown the strong linear focusing forces of a confined electron plasma. In this paper, the first confinement of a pure proton plasma in a Gabor-lens will be discussed. The confinement of a positive space charge column provides either a linear de-focusing force for positively charged ion beams or a linear focusing force for negatively charged heavy ion beams. Very first results of proton confinements and their diagnostics will be presented. A special focus lies on the diagnosis of the proton density distribution, as well as the comparison between the behavior of the proton and electron clouds.

Footnotes

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