

Application of numerical optimizers to the particle loss minimization at the SIS18 septum during slow extraction

Uncontrolled beam loss at the electrostatic septum is a performance limit for hadron accelerators delivering slow-extracted beam to fixed-target experiments. The application of numerical optimizers has been shown to reduce such beam loss. The efficiency depends on the parameters to optimize, the details of the extraction process and the used hardware. In this presentation, the minimization of losses by optimizing the extraction efficiency for the present GSI heavy ion synchrotron SIS18 is described. Three different algorithms were used for that – Nelder-Mead, Powell and COBYLA. Varying two parameters of the sextupole settings allows to halve the beam losses. The advantages and limitations are discussed as well as future plans for improvement.

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