

Extraction and Low Energy Transport of Negative Ions*, A. JAKOB, H. KLEIN, A. LAKATOS, J. POZIMSKI, Inst. f. Angewandte Physik, Uni. Frankfurt - High perveance negative ion beams with low emittance are necessary for several next generation particle accelerators (e.g. spallation sources). The production, extraction and transport of these beams has intrinsic difficulties different from positive ion beams. Therefore intensive research is necessary to fulfil the requirements for these projects. Hence the low energy transport from the plasma generator to the entrance of the first accelerator defining the current and the quality of the beam is of main interest. A caesium free H⁻ volume source based on the high current source for ESS is under construction and will be integrated into an LEBT section to investigate the influence of beam extraction, electron dumping and space charge compensation on beam current and emittance. Multiple beam diagnostic is available along the beam path to examine the influence of different parameters like residual gas pressure, external magnetic and electric fields on beam propagation, space charge compensation and therefore on transmission and emittance growth for negative ion beams. The results of the experimental studies will be compared with numerical simulations.

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