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Beam intensity improvement of high energy heavy ions beams at iThemba LABS

There is an increasing interest in high energy heavy ions beams for the study of heavy ion collision physics. The effective acceleration of heavy ions requires high charge states of elements which can in principle be produced in the electron cyclotron resonance (ECR) ion sources at iThemba LABS. However, the intensity of high charge state beams extracted from the source is limited and their transport must be therefore highly efficient. This is especially the case in the low energy region where charge exchange and space charge processes are dominant. In order to improve the transmission from the source through the injector cyclotron to the separated sector cyclotron (SSC), investigations of possible solutions are being investigated. The accomplishments obtained with the recently designed field gradient focusing spiral inflectors and a second 2nd-harmonic buncher will be presented.

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