

Modelling of ion accumulation processes in EBIS and EBIT

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Abstract. The ion charge state distribution in EBIS and EBIT as well as the corresponding ion current outputs from these devices are modelled for different possible trap operating modes. Thereby, for EBIS and EBIT a model was developed for the calculation of ion charge state distributions considering single and double ionization and charge exchange processes, radiative recombination and strong ion cooling. A detailed description of the model is given. A computer code based on the developed model is able to calculate EBIS and EBIT basic parameters: ion charge state spectrum, ion temperatures and output ion beam currents. Simulation results are given for nitrogen, neon, argon, krypton and uranium and are for some cases compared with available experimental data.