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Modeling of the charge-state separation at ITEP Experimental facility for material science based on a Bernas ion source

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Experimental facility for material science at ITEP based on a multi-charged ion source (ECRIS and Bernas ion source) is developed. The ion charge-state separation is provided by means of the bending magnet. The experiment automation requires the preliminary modeling of the beam particle behavior after the particle extraction from the source, including the particle pre-acceleration and the turn in the dipole magnetic field. The program CAMFT [1] is supposed to be involved into the program of the experiment automation for material research and material processing. CAMFT is developed to simulate the intense charged particle bunch motion in the external magnetic fields with arbitrary geometry by means of the accurate solution of the particle motion equation. Program allows the consideration of the bunch intensity up to 10^{10} ppb. Preliminary calculations are performed at ITEP supercomputer. The results of the simulation of the sheet beam acceleration and following turn are presented for different initial conditions.

[1] H. Y. Barminova, M. S. Saratovskyh. In Proc. 4th ICMSQUARE, Mykonos, Greece, 2015.