

Computer Code Library for Simulation and Optimisation of Electron and Ion Beam Particle Dynamics, V. ALEXANDROV, V. SHEVTSOV, G. SHIRKOV, JINR; Y. BATYGIN, RIKEN - An interactive computer code library for the simulation of charged particle beam transportation is presented. The codes are realised on IBM PC in Visual Basic common interface. It is based on the successive and consistent use of the momentum method of distribution functions (RMS technique) and the method of Multi-Charge-Cords (MCC). The library allows one to calculate the RMS parameters of electron and ion beams, passing through a set of quadrupoles, solenoids, bends, accelerating sections. The RMS code is a fast code very suitable for the first test, design and optimisation of the beam line parameters. The MCC code for multicomponent beam of different masses and charged states requires more time for execution but provides a high accuracy of simulation taking into account the space charge effects, aberrations and beam losses. The library has been tested with the existent Particle-in-Cell code and successfully used to simulate and optimise the tantalum ion beam transportation and focusing from the laser ion source through the Low Energy Beam Transport line (LEBT) to the ionic RFQ linac at CERN.