Simulation of Ion Acceleration in a Two-Beam Electron-Ion Accelerator*, V. BUTENKO, <u>B. IVANOV</u>, NSC KIPT, Kharkov - Computer simulations of ion dynamics in a two-beam electron-ion accelerator have been accomplished for wide set of parameters including ones of the Experimental Accelerating Stand (EAS) that is being constructed. Motion equations take into account all electric fields in the accelerator: electromagnetic wave fields, RF and DC space-charge fields of the driving electron beam, and fields of accelerating ions (using the large particle method). The motion of the ions near the synchronous phase is as follows: the bunch collapses both in radial and phase directions (that corresponds to simultaneous radial and phase focusing), and as a result a part of the ions leave in radial direction to the drift tubes because ion concentration increases so much that the radial focusing fields can not compensate the Coulomb fields. This instability can be called as the collective transversal one. With its account, the ion current of 3ñ4 A have been determined for the EAS parameters.