Optimization of an Axially Symmetrical Electrostatic Focusing System*, A. DYMNIKOV, G. MARTINEZ, Dept. Física Aplicada III, Fac. de Física, U.C.M. 28040, Madrid, Spain - A method for the optimization of an axially symmetrical electrostatic system is described. An accurate version of BEM is used to solve Laplace's equation to obtain the potential along the optical axis. We use this field when we reformulate the nonlinear equation of particle motion in phase space as a linear equation in phase moment space. The electrostatic field coefficient (12x12) matrix for the relativistic case in the space of phase variable in which the phase volume remains unchanged has been obtained. A continuous generalized analogue of Gauss brackets is used to calculate the matrizant for the motion equation with the field coefficient matrix. In this method there is a rigorous conservation of the phase volume of the beam at each stage of the calculation. A numerical optimization of the system is performed. The above matrizant for the given geometries is used and the sizes of the object (first) and aperture (second) diaphragms are varied to obtain the minimum spot size at the specimen for a fixed emittance.

* Work supported by DGICYT, Ref: SAB95-0208.