

Ion Injection through Fringe Fields of Dipole Magnets, B. SCHILLINGER, T. WEILAND, TH-DARMSTADT; B. LANGENBECK, GSI - A new numerical procedure computing the ion optical transformation matrix up to second order will be presented. The magnetic flux distribution of an ESR dipole magnet is determined with the electromagnetic simulator MAFIA. The reference trajectory between the inflector magnet and the in-ring septum magnet, which enters the fringe field of the dipole in a tangential way, is integrated by using the calculated discrete field data. Along the trajectory, the radial derivatives of the field distribution are calculated and the linear ion optical matrix elements are determined by integrating the well known differential equations of the Hill type. We obtain the second order coefficients by integrating the corresponding driving functions as proposed by K.L. Brown and K.G. Steffen. The new procedure has been tested by applying it to a dipole with homogenous field and with parallel entrance and exit faces. The results are compared with calculations using the ion optical codes GICO and RAYTRACE.