

Second Order Error Calculation Package for Beam Transfer Lines, S. FARTOUKH, O. NAPOLY, CEA-SACLAY - In the aim of investigating the tolerances of final focus systems for linear colliders, a program FFSE2 has been written to calculate and display the effect of misalignments and field errors on the map of beam transfer lines. Using the MAD symplectic coordinates, the orbit and the transfer matrix are expanded at the second order in the errors, thus including the cross-talk between two different errors originating from different magnets, and the second order T-matrix is expanded at the first order in the errors. All error sources which affect the transfer map up to the second order map T have been included, namely: the 6-dimensional Euclidean group of magnet displacements and the normal and skew field errors, not already described by Euclidean displacements, up to the sextupolar harmonics in dipole, quadrupole and sextupole magnets. For the special application to final focus systems, the program further calculates the corresponding tolerances based on the spot size growth and luminosity loss, as calculated from the linear optics, at the interaction point. The program is interfaced with the graphics package PAW, allowing the analytic display of the calculated errors and tolerances.