

Beta-match

Beta-match.f calculates the matching of the beam to the undulator/focusing structure for a Genesis 1.3 NAMELIST input and lattice file.

Beta-match reads the normal fortran namelist and, when needed, the lattice file (when specified in the namelist either by MAGIN or by defining the filename of the lattice-file). It calculates from the information of the lattice, the energy and the emittance how to match the beam and saves the complete file as "TEMPLATE.IN". This file should therefore contain exactly the information that is in the input file (with the beam matched) plus all parameters that CAN be in the namelist. However, the OUTPUTFILE, which needs to be specified for a batch job, will have to be added manually afterwards, even when it was in the original file (this is still a bug?).

IMPORTANT: for the matching, the lattice file has to be completely periodic. Since the program just uses matrix multiplication and comparing the α and β at the beginning and end of the structure, the procedure will not work if the structure is not periodic. The program cannot distinguish between a not fully periodic structure and, for example, an unstable structure because the phase advance between quadrupoles is too large. In case of problems, one can try checking a single cell first instead of a long, multi-segmented undulator.

Beta-match needs the following additional files:

From Genesis (version of 04-03-11):

The following common blocks: input.cmn, io.cmn, magnet.cmn, sim.cmn, time.cmn

The following definition file: genesis.def

The following subroutine files: check.f, magfield.f, string.f, math.f

In addition, part of the Genesis "output.f" is taken (called here "varia.f"). If one would take the complete "output.f", additional common blocks etc. would be needed. Furthermore, in the subroutine "last" most of the lines are commented out. Also "input.f" has been taken only partially (with as new name "input-red.f").