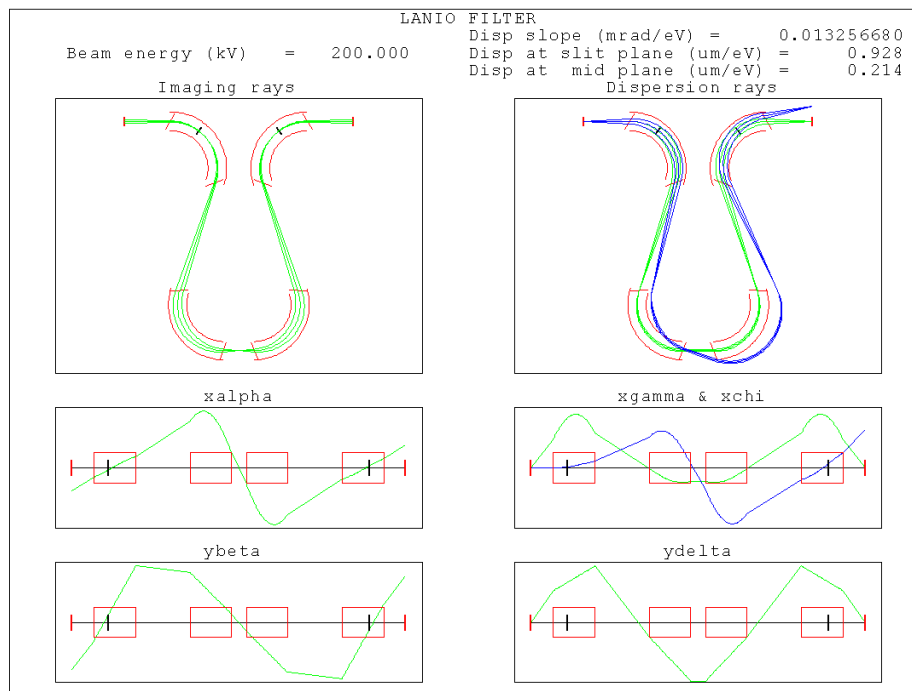


# FILTER

## Simulation of imaging energy filters



The FILTER software is a stand alone package which is used for the design of magnetic imaging energy filters



*Imaging and dispersion rays in the Lanio omega filter*

A range of possible filter geometries can be analysed using a Sharp Cut-Off Field (SCOFF) field model program, to establish a promising design. Promising designs can then be analysed in more detail using software that accounts for the real, extended fringing fields at the entrance and exit of each magnet, including the 3D fields in the fringing regions of the inhomogeneous magnets.

The tilted polefaces of the inhomogeneous magnets necessitate the use of a fully 3D field calculation in the fringing regions of the magnets. (In the fringing regions of homogeneous magnets, a 2D field analysis is used, but the same principle as for the 3D calculation is used.) The calculation is split into two stages: firstly the calculation of the axis and rays in the exit and entrance region of each magnet using a fully 3D potential computation and ray trace; secondly, the computation of the axis, rays and optical properties in the whole filter.

When each magnet's fringing region has been analysed and the appropriate transfer functions have been extracted for each discrete tilt angle, the optical properties can then be computed.