

Codes comparison

Tunes versus energy for large & small dipole radius

Machine :

SOLEIL lattice : Standart synchrotron machine, large dipole radius
2750 GeV / Rdipole=5.36 m / circ=352 m

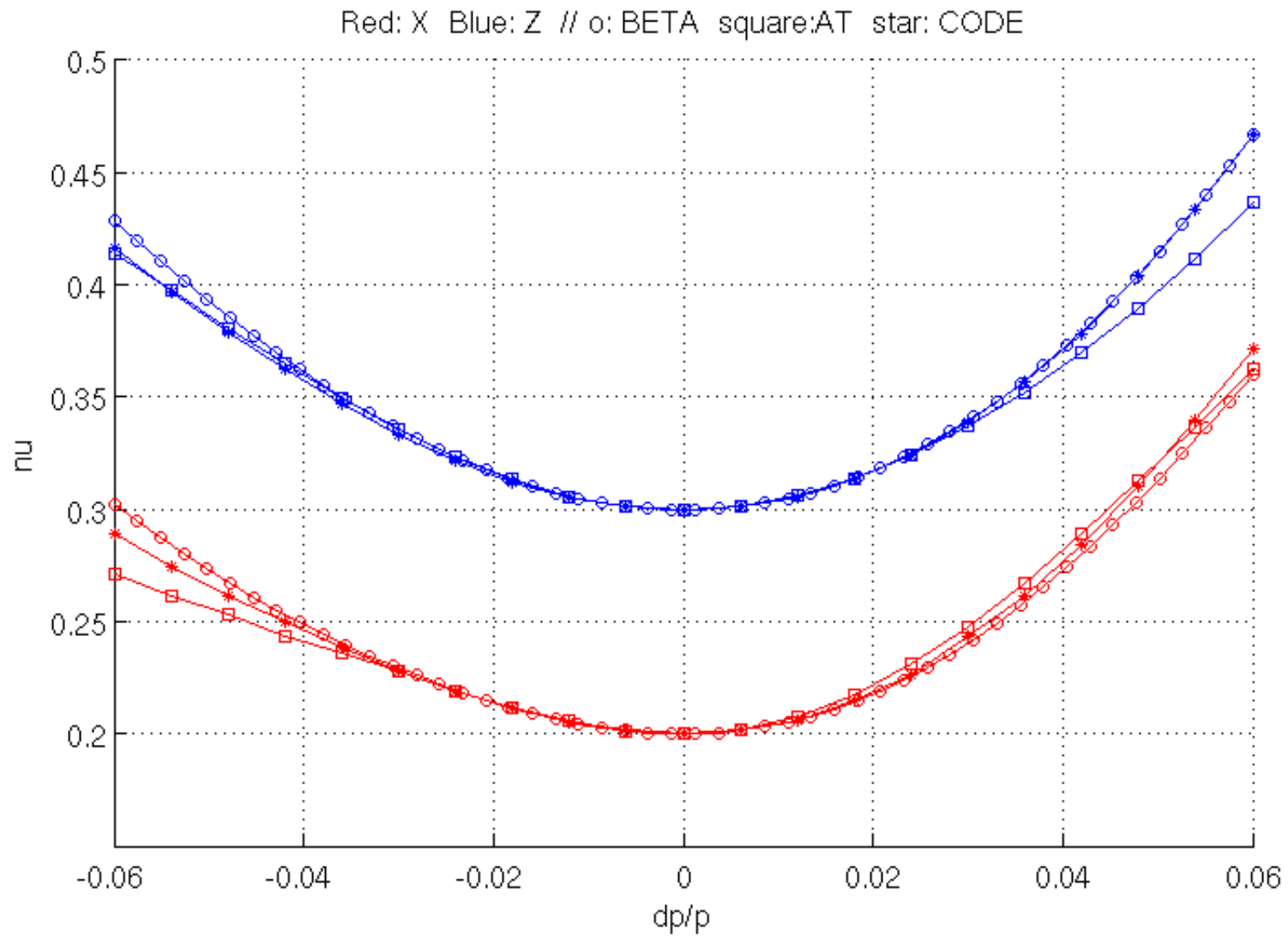
Perfect hard edge element
Sextupole as kick
Optimisations and Chromaticities set to 0
With BETA

ThomX lattice : Compact ring, small dipole radius
50 MeV / Rdipole =0.352 m / circ=14.47 m

Codes :

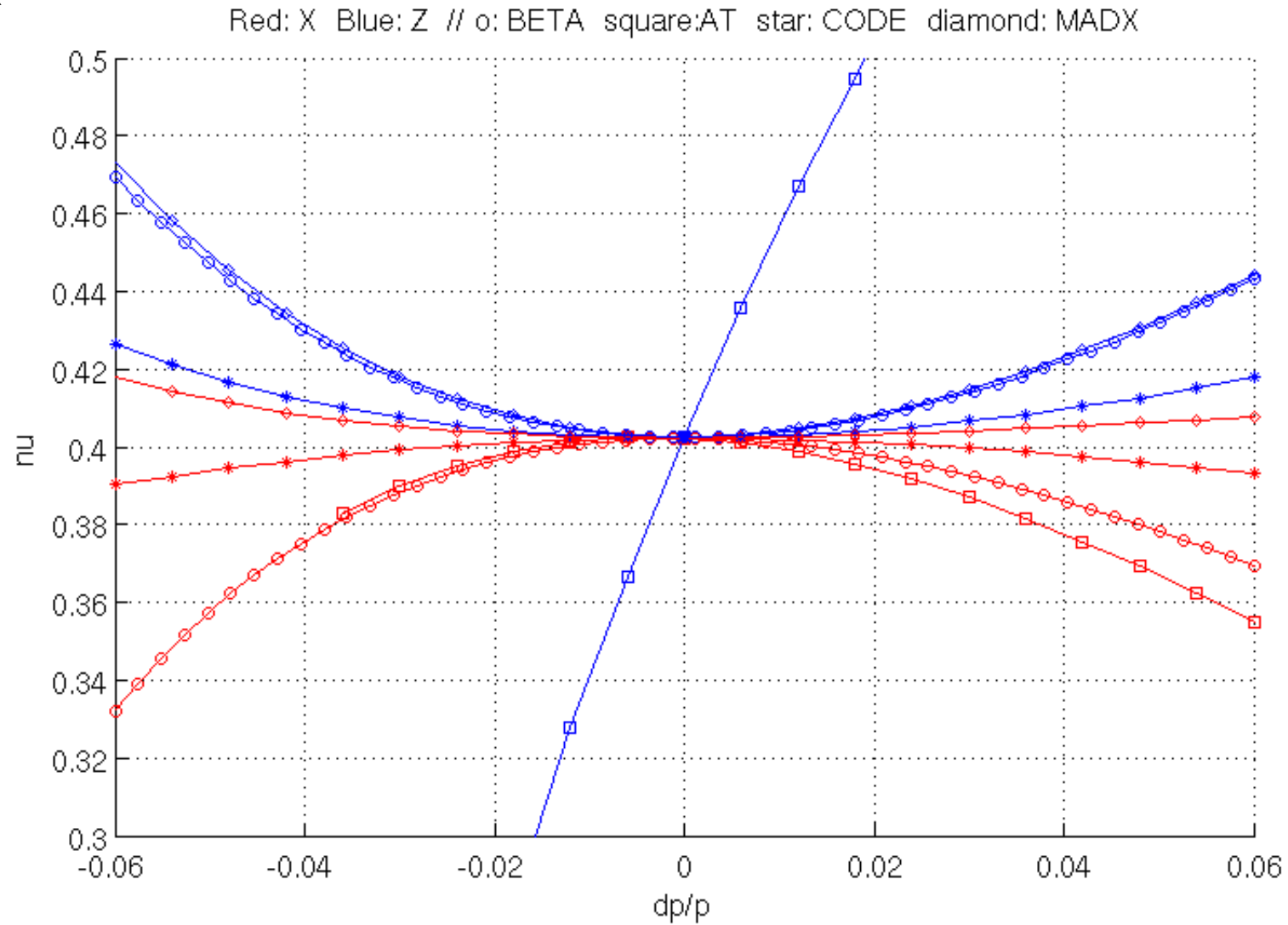
BETA : Scaling method, find COD by iteration and resize dipole geometry, 4D tracking
AT : Ruth&Forest 6D symplectic integrator order 4, as TRACYII
MADX : Ruth&Forest 6D symplectic integrator order 4 + small radius terms
CODE : Exact geometrical dipole (or L. Nadolski Hamiltonian) resolution (limited to pure sector)

SOLEIL



All codes agree for linear chromatic terms
Small divergence for large dp/P

ThomX



All codes agree for linear chromatic terms except AT in Z (dipole edge effect !)

All codes disagree for higher order chromatic terms, except BETA and MADX in Z ?