

BDS Status Update

Glen White, SLAC

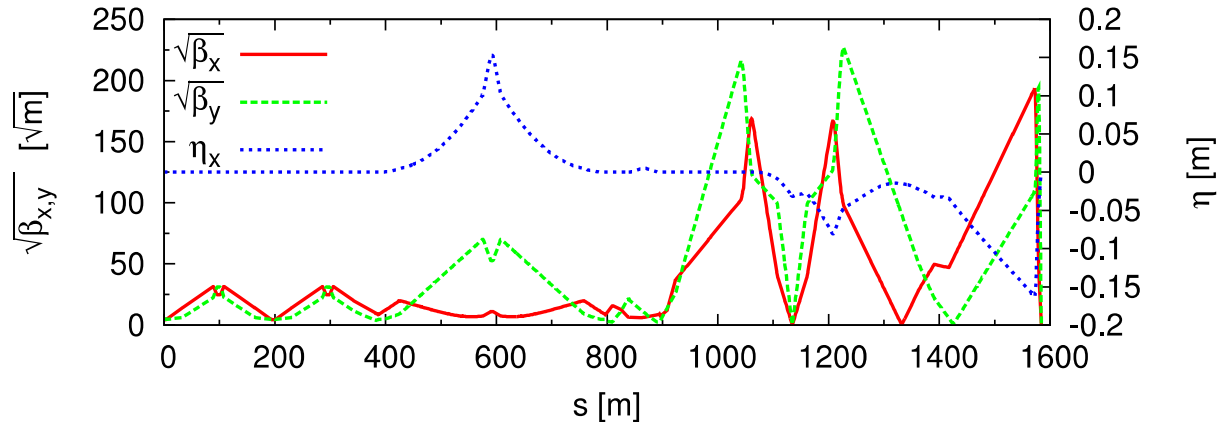
July 11 2014

ADI Fuze Meeting

Ongoing BDS Work

- Lattice matching work for baseline 3.51 & 4.5m L* optics mostly complete.
 - Matched for nominal luminosity, including optimized phase relations for collimation systems and feedback devices
 - Includes split QF7 FF quad with access to IP-phase in both planes
 - So, now extra magnet QF7 -> QF7A & QF7B
- Beam dynamics work
 - Revived tuning simulations
 - Improved tuning algorithm
 - Adding skew-sextupole magnets to deal with T322 aberration
 - Work ongoing to study impact of 2 vs. 1 L* option across push-pull operation.
- Optics deck management
 - Woodley started work gathering and producing self-consistent DR-dump set of lattices (a la 2006e release).
 - Aim to get new deck files released to DESY SVN repository (including updated BDS decks) in coming weeks...

BDS Lattice Matching



$$\beta_{x,y}^* [\text{m}] = 0.011, 0.00048$$

$$\alpha_{x,y}^* [] = 0.0, 0.0$$

$$\alpha_{x,y}^{\text{MIP}} [] = 0.1, 0.1$$

$$\eta_{x,y}^* [\text{m}] = 10^{-6}, 0$$

$$\Delta\mu_{x,y}^{\text{MIP-IP}} [2\pi] = 0.0, 0.0$$

$$\Delta\mu_{x,y}^{\text{SPEX-IP}} [2\pi] = 0.17, 0.21$$

$$\Delta\mu_{x,y}^{\text{SP4-IP}} [2\pi] = 0.21, 0.2$$

$$\Delta\mu_{x,y}^{\text{SPEX-IP}} [2\pi] = 0.25, 0.25$$

$$\sigma_{x,y}^* [\text{nm}] = 485, 5.8 \text{ nm}$$

$$\mathcal{L} = 1.5 \cdot 10^{34} \text{ cm}^{-2} \text{ s}^{-1}$$

- Matching performed based on modified “Seryi” procedure using unified tool based on MADX/PTC by Edu.
- Some differences with different tracking codes need to be understood
- Also some iteration needed to reduce some large quad strengths

Next Steps

- Finish fine-tuning matching for 3.51m and 4.5m baseline optics.
- Cross-comparison of multiple tracking codes
- Check tolerances
- Check collimation requirements, collimation efficiency, backgrounds, muon shielding etc
 - Interface with BDSIM
- Optics for other TDR parameter options.

Lattice Review

- Aim for detailed BDS lattice presentations and review of status during Ichinoseki meeting in September.
 - Review baseline studies and state of alternate considerations (separated function chrom.-correction & reduced sextupole optics).
- Also aiming for beam dynamics presentations and presentation of case for single L*