Current Status of SuperKEKB IR Design

2009-07-07

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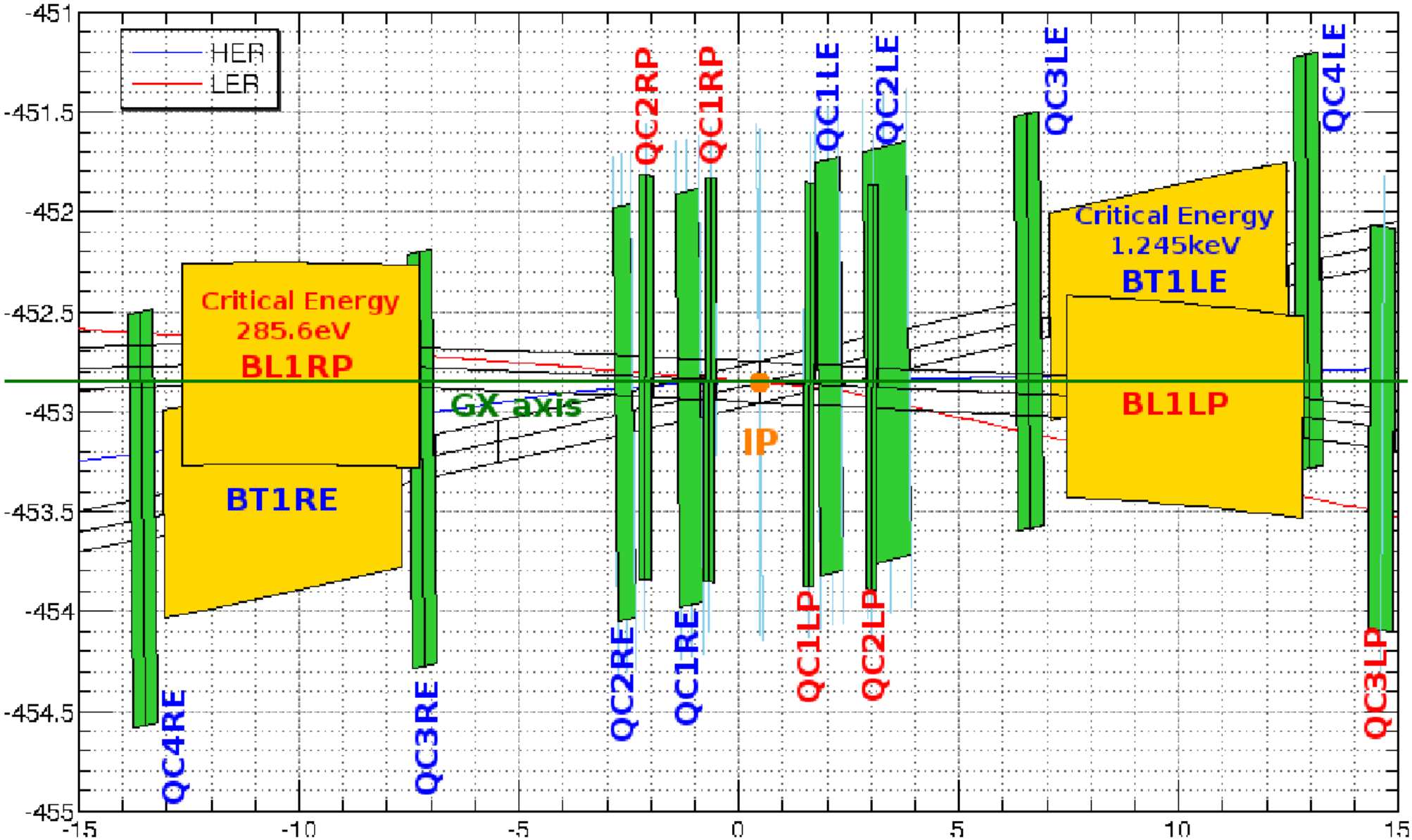
Machine Parameter @ 2009/06/25

NanoBeam A6 No Crab Waist

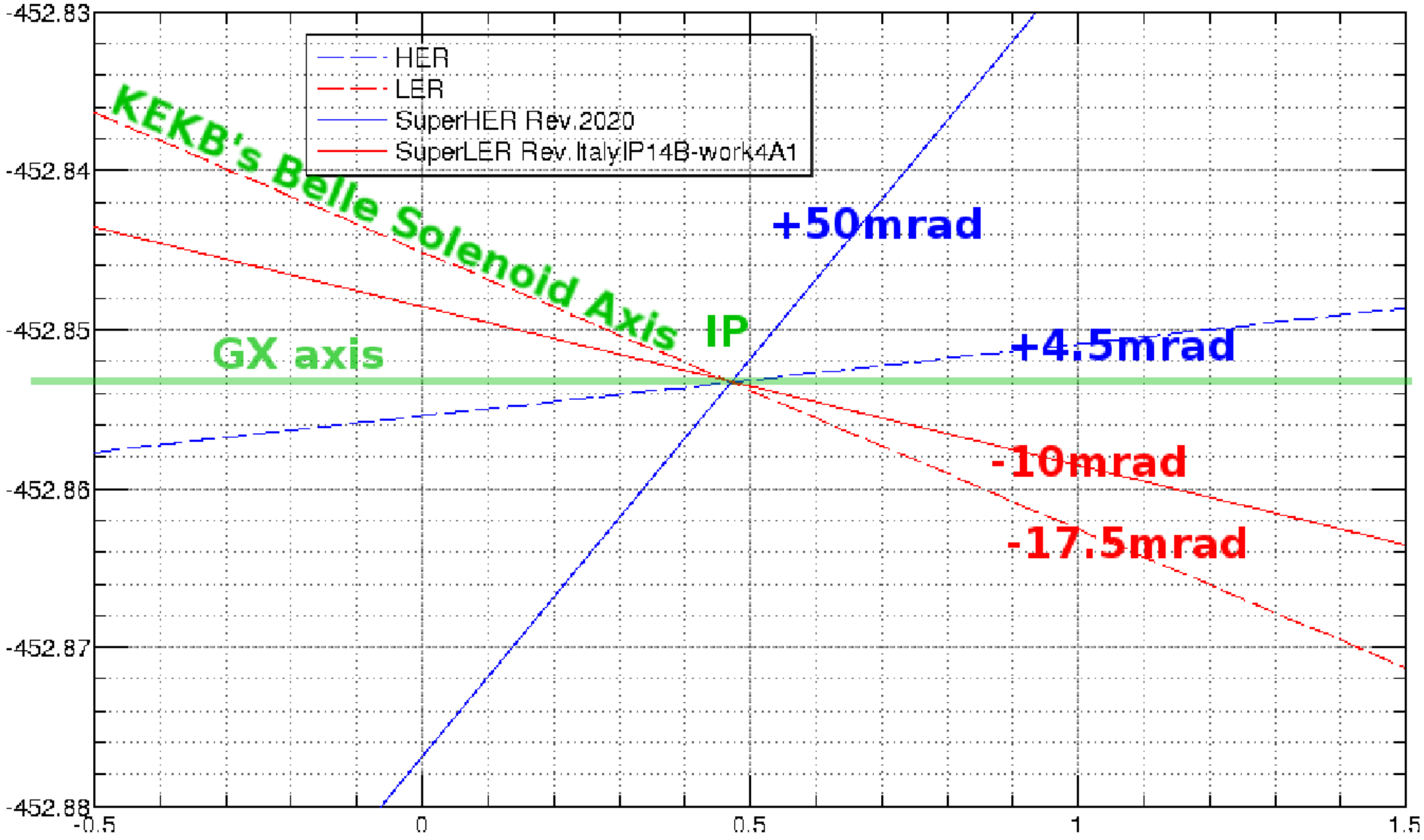
- ε_x[nm](LER/HER) 2.8/2.0
- κ [%] 0.74/1.80
- β_x[mm] 17.8/25.9
- β_y[μm] 260/260
- σ_z[mm] 5.0/5.0
- n_p/n_e[$\times 10^{10}$] 10.7/6.17
- E_p/E_e[GeV] 3.5/8.0
- # of bunch 2252
- Circumference[m] 3016
- ϕ [mrad] 30 (half crossing)

IR Layout[1] @ 2009/07/03

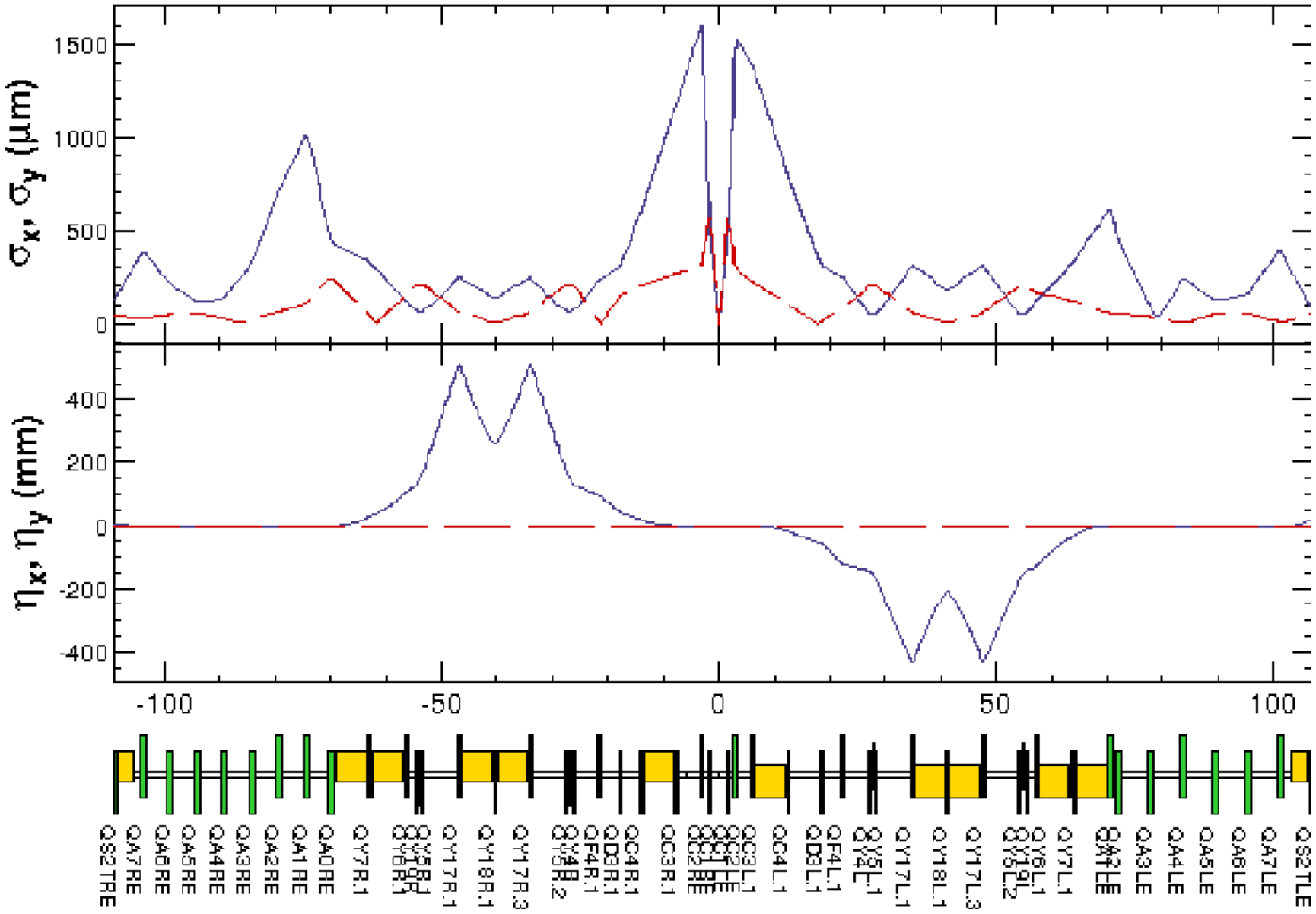


Magnet s-location from SAD's GeometryPlot[]
Size of element symbol is not correct!

IR Layout[2] @ 2009/07/03

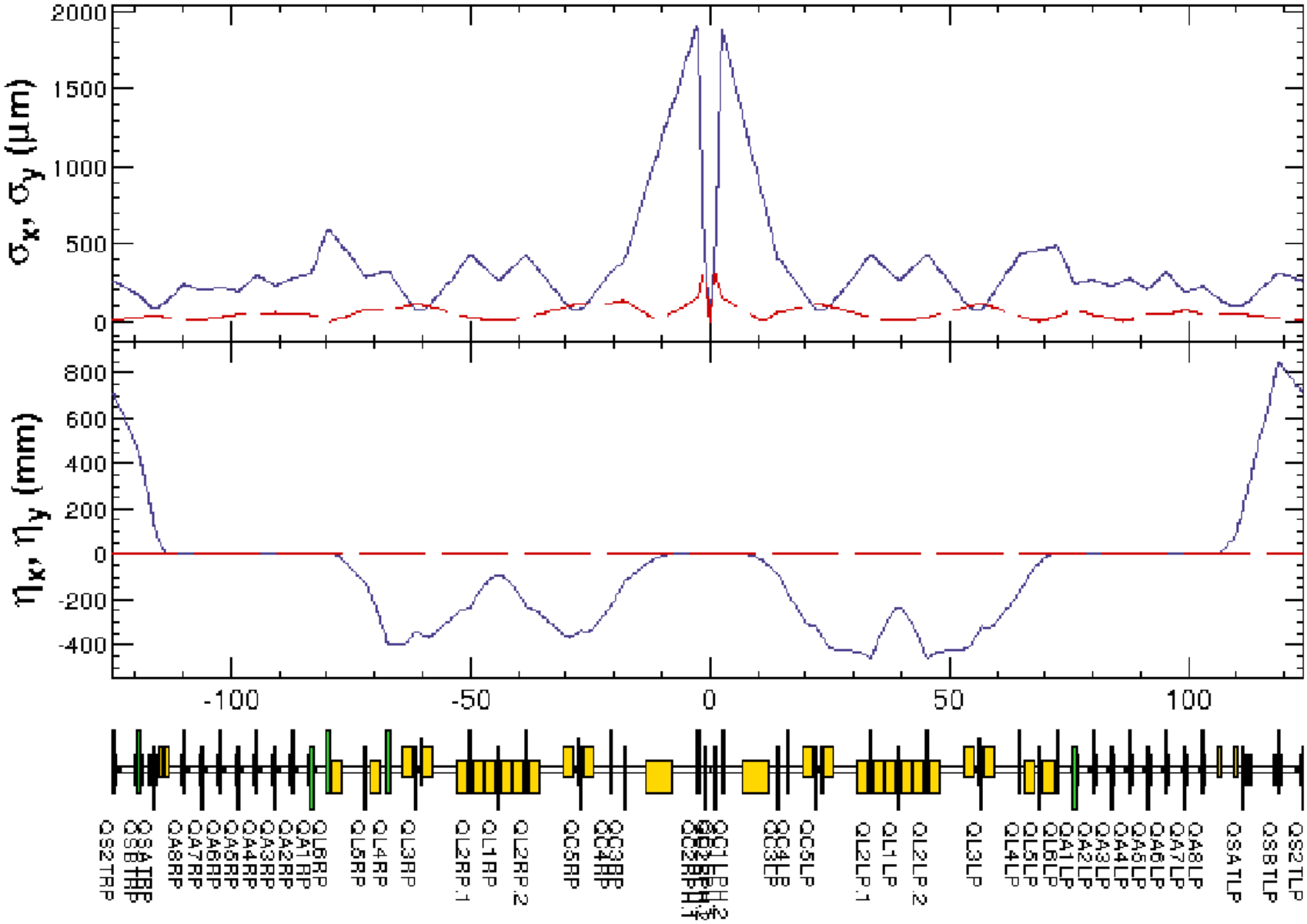


IR Optics[HER] @ 2009/07/03



without beam-beam(single beam size)

IR Optics[LER] @ 2009/07/03



without beam-beam(single beam size)

Design Strategy & TODO

- IR Design Constraint
  - Current KEKB tunnel geometry
  - Separated final focusing quadrupole magnet geometry
  - Local chromaticity correction performance
  - Low emittance Local chromaticity correction
- Current Critical Issue
  - LER Touchek lifetime is too short.(< 200sec)
    - Limited by QC1's non-linear fringe feild(hard to cure)
  - Install SC QC1* quadrupole into current location is difficulty.
    - Switch to PMQ?
    - Increase crossing angle?
- TODO
  - Update QC* geometry/IP design parameter
  - Improve chromaticity correction/dynamic aperture
  - Implement QC* multipole/distribution and solenoid
  - etc...