Summary of 2006 Lattice Design Project for 3770 Run Period


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CESR-c Lattice Design Meeting
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http://www.lepp.cornell.edu/~critten/Summary_3770.pdf
Six Weeks of Development

➢ Systematic, collaborative effort over six weeks

➢ Historical perspective on 2005 running
  ➢ (ST/2005, JAC/2006 PAC contributions)

➢ Comparison of 3770, 4170, 3686 lattices

➢ New era of lattice design: improved constraint set, ASOL, BBI

➢ Developed quick diagnostic turnaround
  ➢ First understanding of effect on dynamic aperture of many constraints
  ➢ Compare pretzel/crossing angle in lattice design iterations
  ➢ $Q_x$, $Q_v$, $Q_s$, $Q_x - Q_v - Q_s$, all players
Present “Work in Progress” lattice slightly worse at zero energy offset. No BBI compensation yet.
Two Recent Questions (1b)

Compare 2005 and new lattices at same crossing angle (3.37 mrad) and tunes (0.518, 0.570, -0.089)

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3770_wip_18

Present “Work in Progress” lattice better dynamic aperture off-energy
How do the DA plots depend on launch phase at IP? Simple test: launch at non-zero x' (1σ = 0.4 mrad)

Horizontal asymmetry at high vertical amplitude mostly gone, but DA at small vertical amplitude narrower
MJF: Max arc displacement more important than crossing angle

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**3770_wip_18**

New lattice similar

Orbits include effect of 1 mA positron bunch current
Pretzel separation more uniform

Orbits include effect of 1 mA positron bunch current
➢ Sextupole Redesign and BBI Optimization

➢ Status report from MJF to follow

➢ Startup Plan (Machine Studies Meeting 11/16)

➢ Startup Sunday 11/19
Compare 2005 and new lattices at same crossing angle (3.37 mrad) and tunes (0.518, 0.570, -0.089)