

ICD-II Update

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Fermilab

Challenges pointed out at collaboration meeting

- Chopper
 - ◆ High power
 - ◆ High frequency band
- Injection
 - ◆ Foil overheating, $T_{max} = 2500 \text{ K}^{\circ}$

Changes to the ICD-II

- Chopper
 - ◆ Reduced frequency for RFQ (to 162.5 MHz)
 - ◆ Increased length of MEBT
 - Chopper length: 0.3 m → ~5 m(detailed consideration still pending)
- Foil stripping
 - ◆ Optics change in injection straight
 - $\beta_x\beta_y$ at foil is increased by ~ 12 times
 - Foil heating: 2500 → 1500 K[°]
 - Increased length of the injection straight 3.5 m → 10.5 m
 - ⇒ Enough space for the injection dump
 - ⇒ Dogleg field changes
 - to allow injection energy variation ±20%

Other concerns expressed at collaboration meeting

- Create conditions for both foil and laser stripping
 - ◆ Contradictory requirements
 - Optics changes are required for laser stripping
 - Place for additional quads have to be anticipated
- Emittance and intensity budgets
 - ◆ Linac
 - ?
 - ◆ RCS
 - from injection to extraction: $22 \rightarrow 25 \text{ mm mrad}$
 - 3% intensity loss at injection

What need to be addressed in the near future

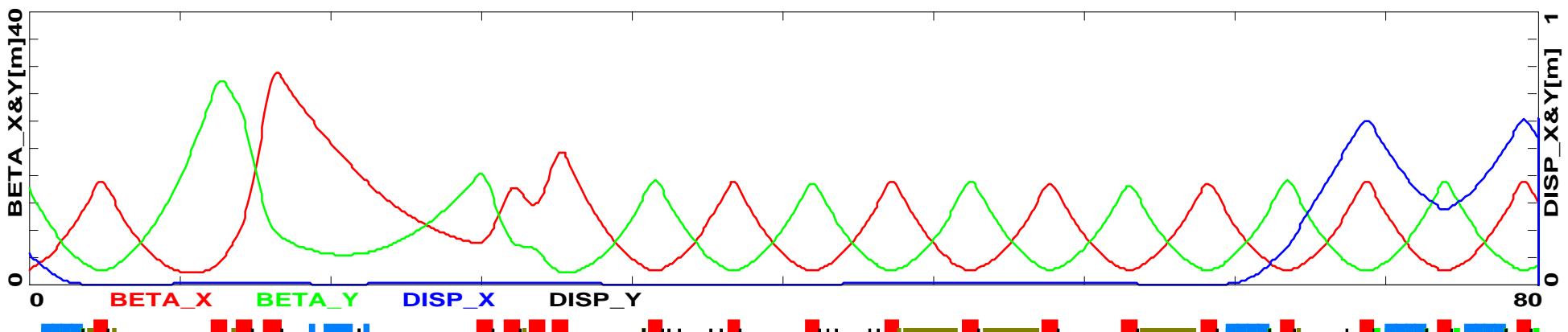
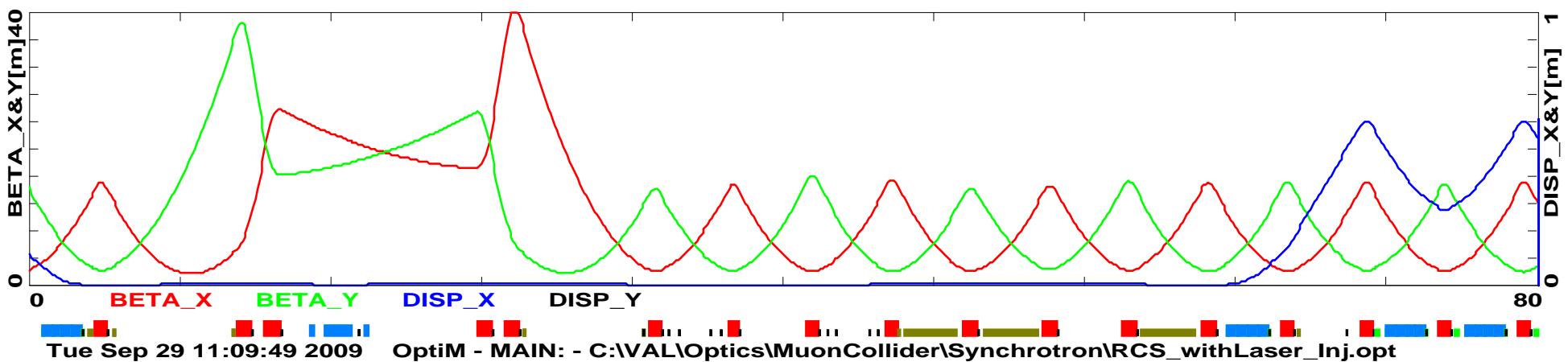
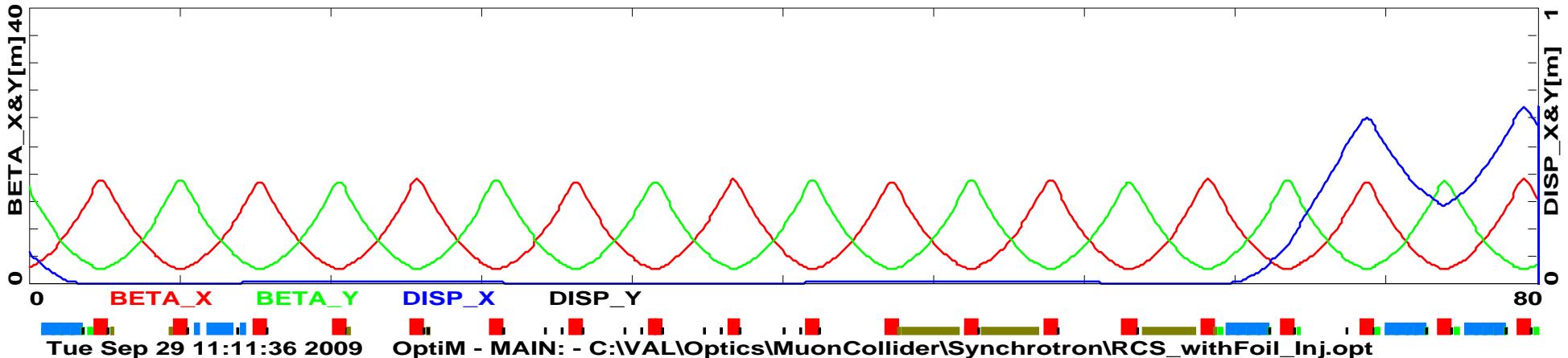
- We need to settle the maximum energy with experimental physicists
 - ◆ $2.X \text{ GeV}$; $X = ?$

Other challenges or concerns

- Price tag
 - ◆ Scale of Reduction
 - without sacrifice of major features
 - what can be sacrificed

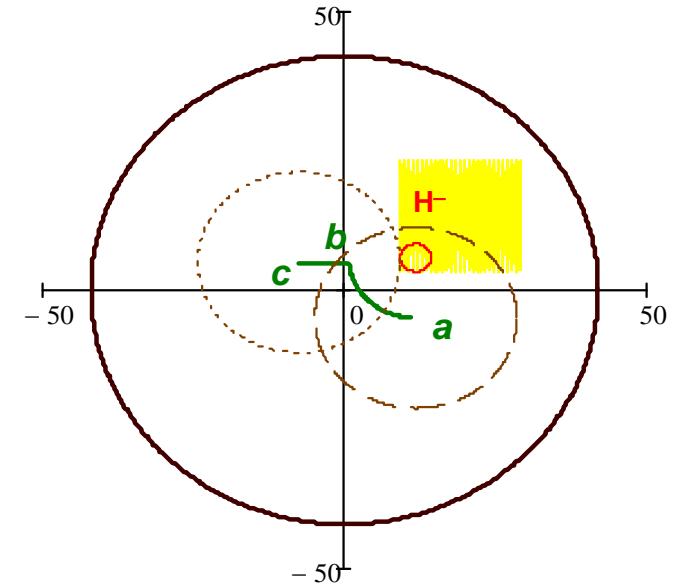
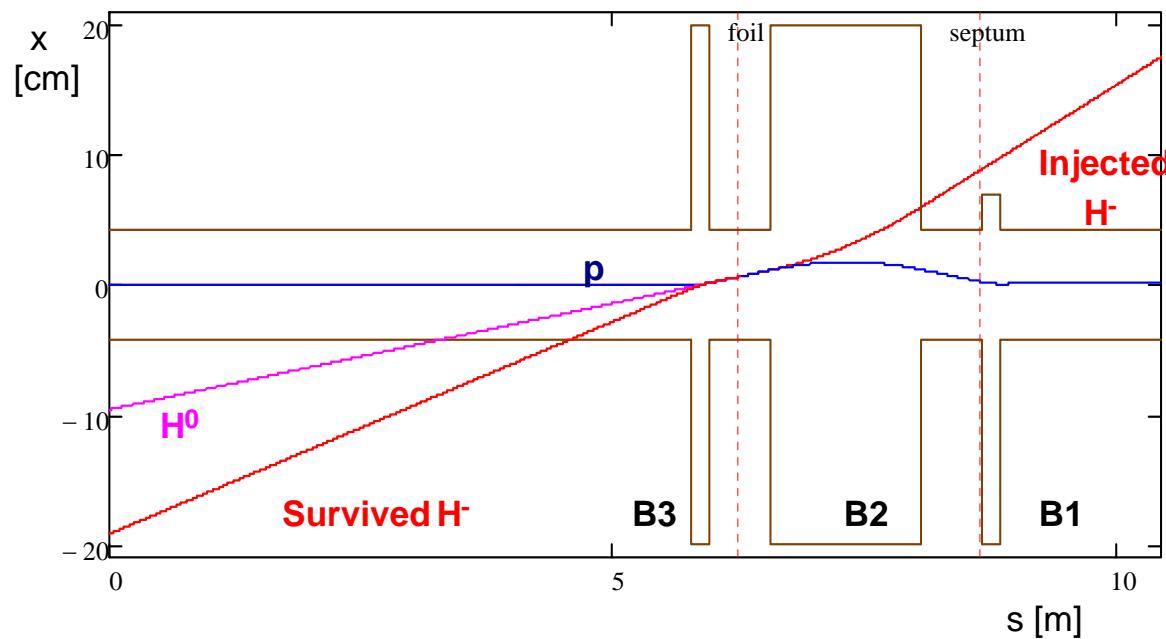
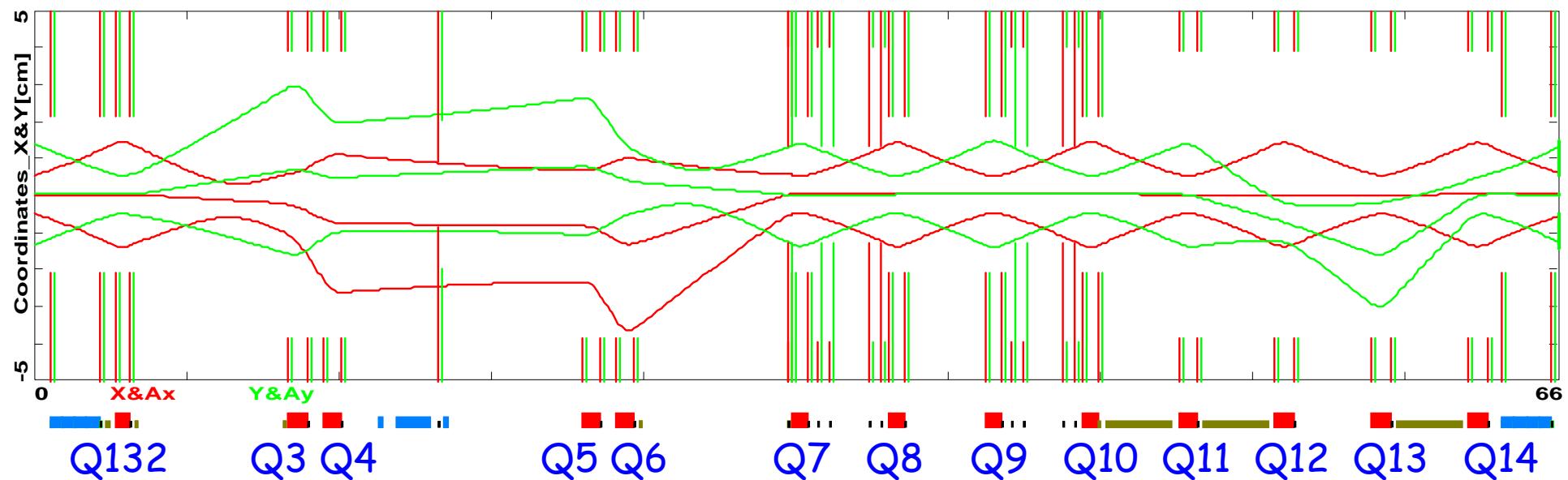
Optics changes for RCS injection

Tue Sep 29 11:13:39 2009 OptiM - MAIN: - C:\VAL\Optics\MuonCollider\Synchrotron\Synchrotron.opt



Injection-extraction straight

Thu Sep 24 13:53:25 2009 OptiM - MAIN: - C:\VAL\Optics\MuonCollider\Synchrotron\RCS_withFoil_Inj.opt



Plans for ICD-II document

Introduction (8 pages)

- Final correction is required

Beam Physics (52 pages)

Status is good enough to move to to and/or finish the technical systems

- Chopper
 - ◆ Webber, optics help ?, 2 ? weeks
- RFQ ?
- Linac, Solyak, 1 week
 - ◆ Corrections are in work,
 - ◆ Simulations to be reported on the next meeting
- RCS - done
- Transfer lines and dumps
 - ◆ Johnson, Lebedev

Technical sections

- RF power for linac - corrections are required
- Magnets - done
- Power supplies, Linac + RCS, D. Wolff ?
- RF for RCS, some corrections are required, Reid, Lebedev
- RCS vacuum, minor corrections, Lebedev
- LL RF - missing, B. Chaise
- Safety and radiation shielding - corrections, A. Leveling
- Civil construction - good shape