OSC Bypass 1

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Path Length Quantities (lowest order)

- **Particle action:**

$$\sigma^2_{\Delta s} = \sigma^2_{\Delta s\epsilon} + \sigma^2_{\Delta sp}$$

$$\sigma^2_{\Delta s\epsilon} = J \left(\beta_p M^2_{51} - 2\alpha_p M_{51} M_{52} + \gamma_p M^2_{52} \right)$$
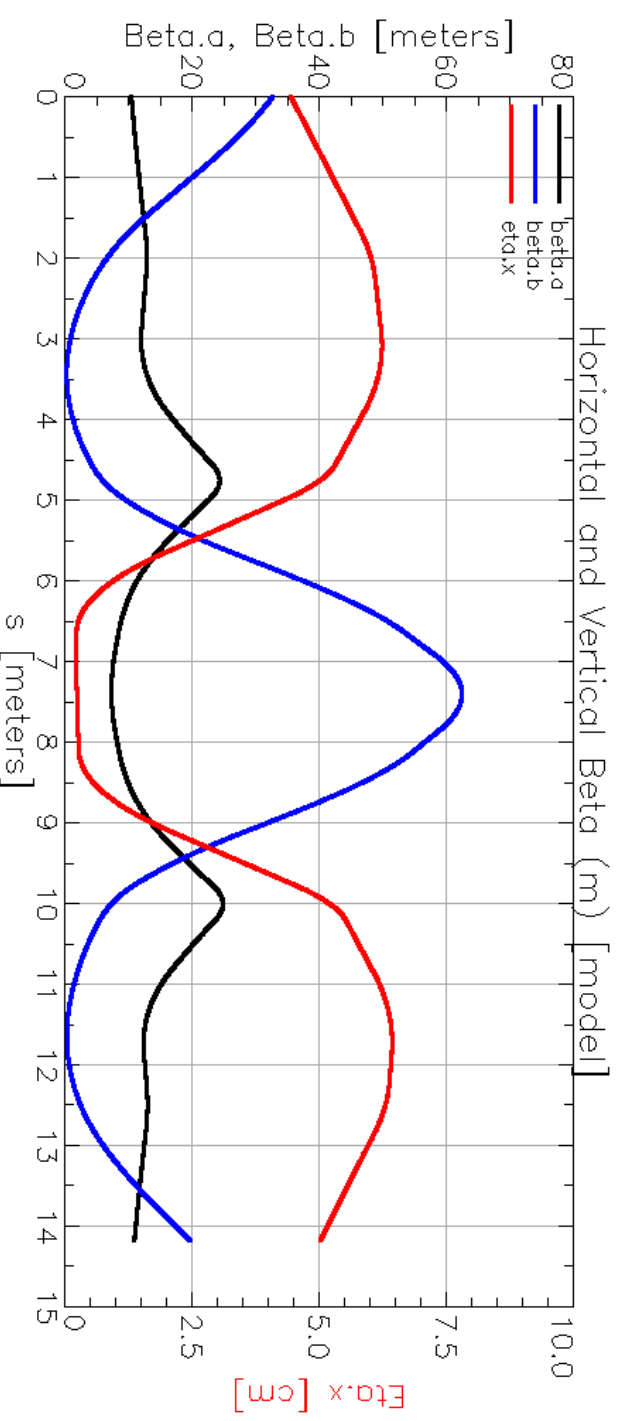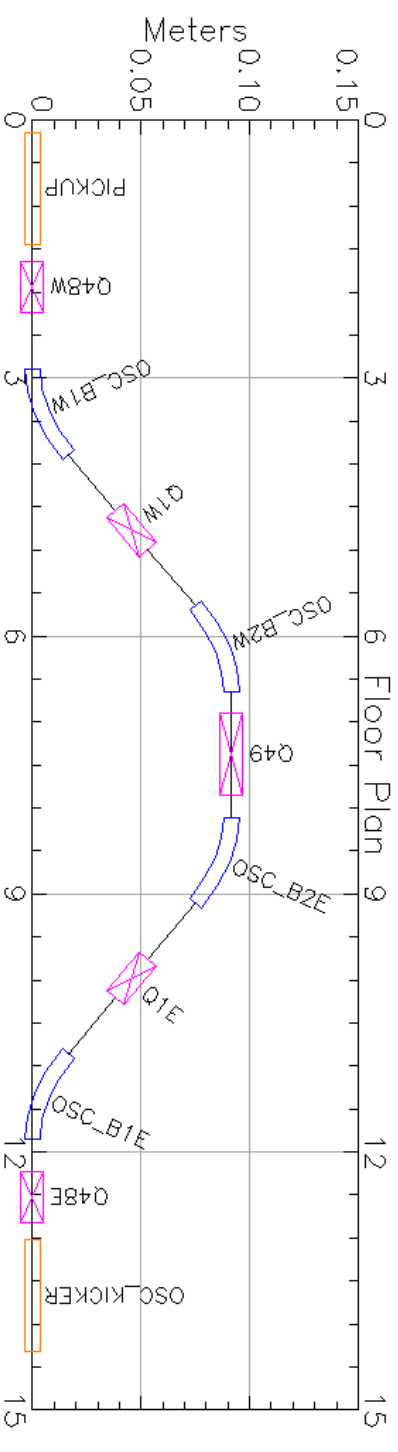
- **Energy defect:**

$$\sigma^2_{\Delta sp} = \left(\frac{\Delta p}{p} \right)^2 \left(M_{51} D_p + M_{52} D'_p + M_{56} \right)^2$$

- M_ij are elements of transfer matrix from pickup to kicker
- taken as middle of pickup and kicker
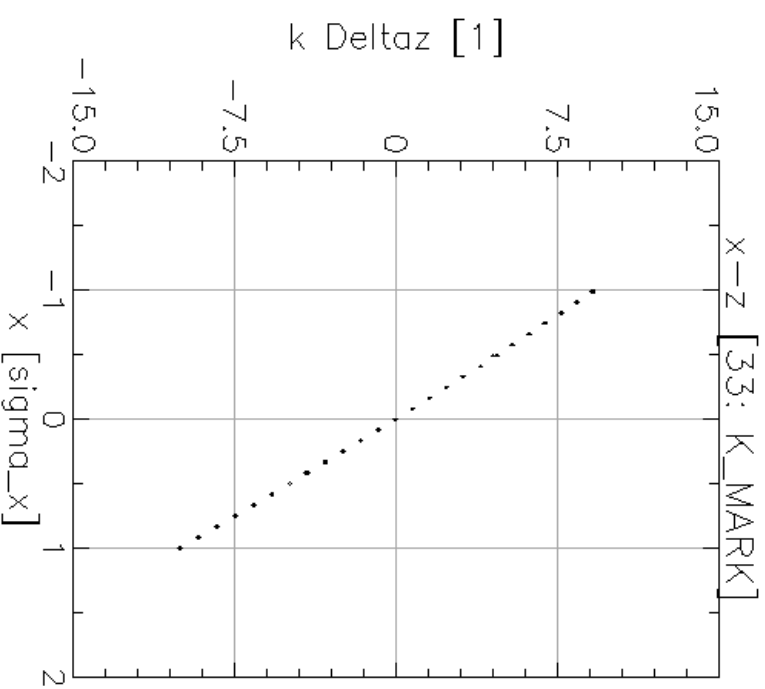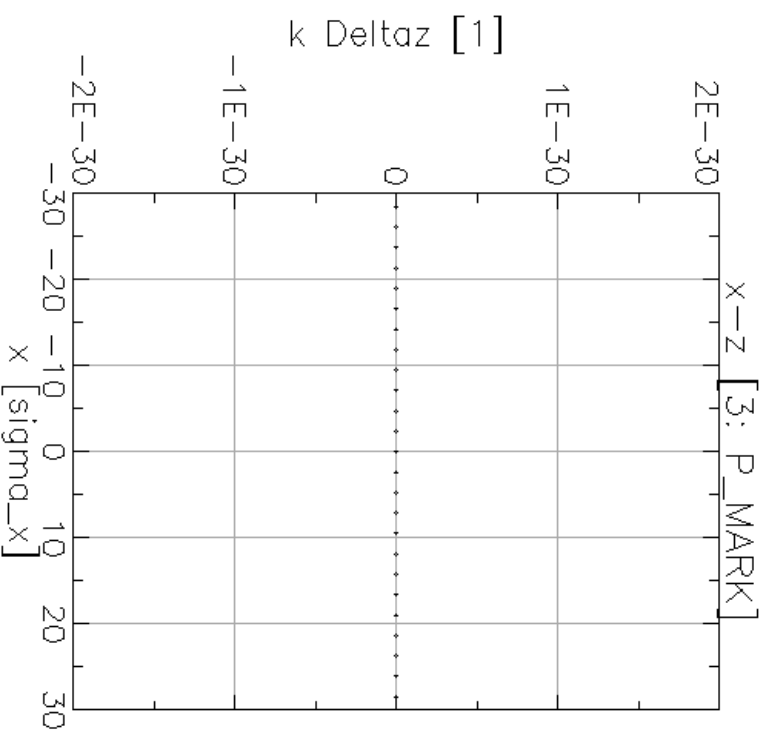- p subscripted quantities are taken at middle of kicker

Bypass Line

- Extracted from osc_16_outboard_inse rt.bmad
- Quad moments in quads and bends
- Element strengths are symmetric.
- Quad moments adjusted from original values.

- Extends ~ 9.1 cm
- Δs = 2.68 mm
- 1.91 degree bends

Floor Plan

PICKUP Q48W OSC_B1W Q1W OSC_B2W Q49 OSC_B2E Q1E OSC_B1E Q48E OSC_KICKER

Horizontal and Vertical Beta (m) [model]

beta.a
beta.b
eta.x

Action dependent ΔJ

- Initial coordinates at pickup: All zero, except flat distribution in x
- Maps to a distribution in Δs
- x normalized by 1-σx = 22.2 μm
- Δs normalized by optical wave number (2π / 1 μm)
- |k Δs| that exceed mu0 = 2.405 are not damped
- Leading term is 8.534E-04

x−z [3: P_MARK]

k Deltaz [1]

x [sigma_x]

x−z [33: K_MARK]

k Deltaz [1]

x [sigma_x]

Momentum dependent Δs

- Initial coordinates at pickup: All zero, except flat distribution in pz
- Maps to a distribution in Δs
- pz normalized by 1-σp = 2.9 10^{-4}
- Δs normalized by optical wave number (2π / 1 μm)
- |k Δs| that exceed mu0 = 2.405 are not damped
- Leading term is 3.201E-03

pz−z [3: P_MARK]

k Deltaz [1]

pz [sigma_pz]

pz−z [33: K_MARK]

k Deltaz [1]

pz [sigma_pz]