

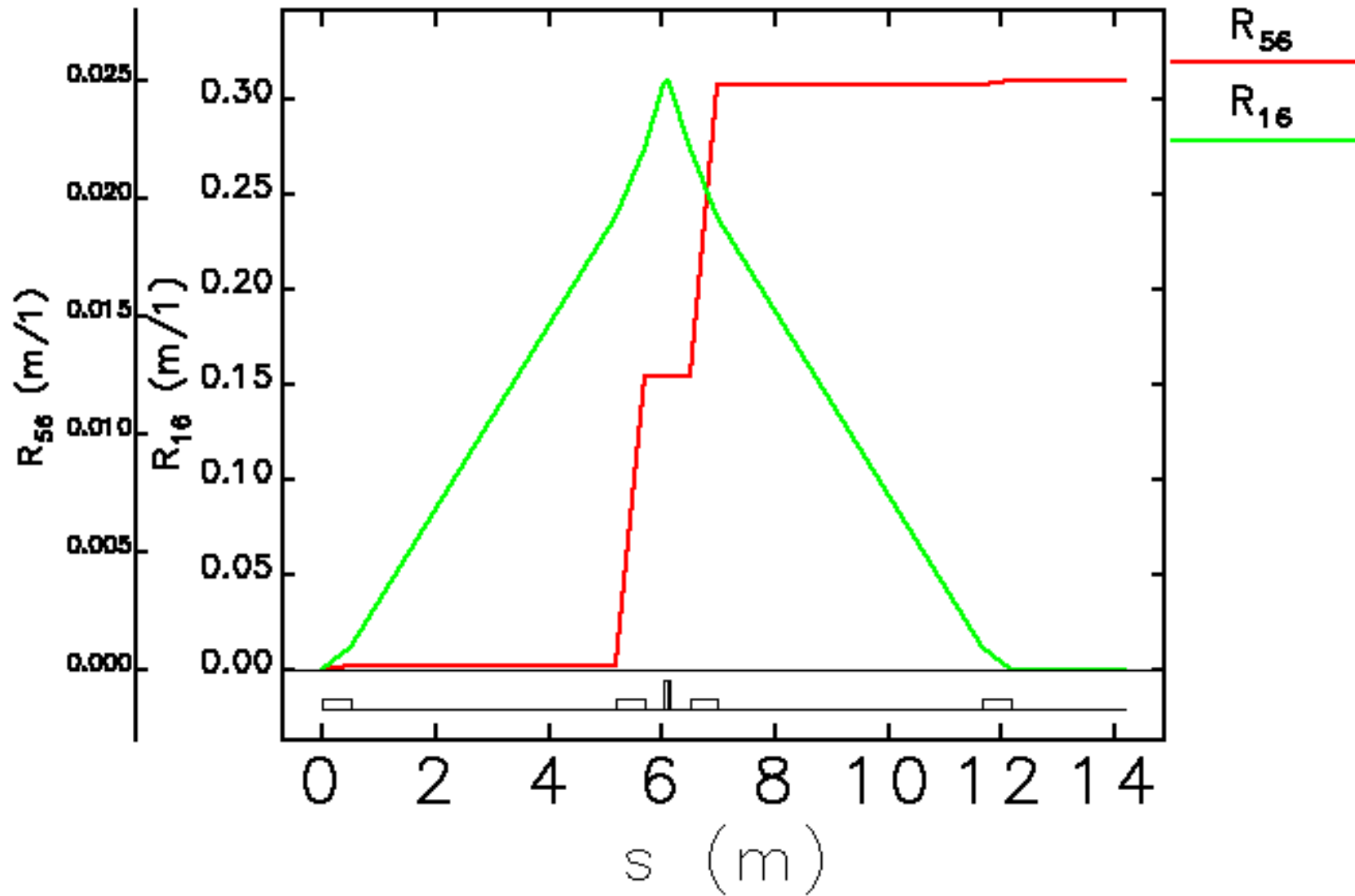
Effect of Sign of R_{56}

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Compressor Design

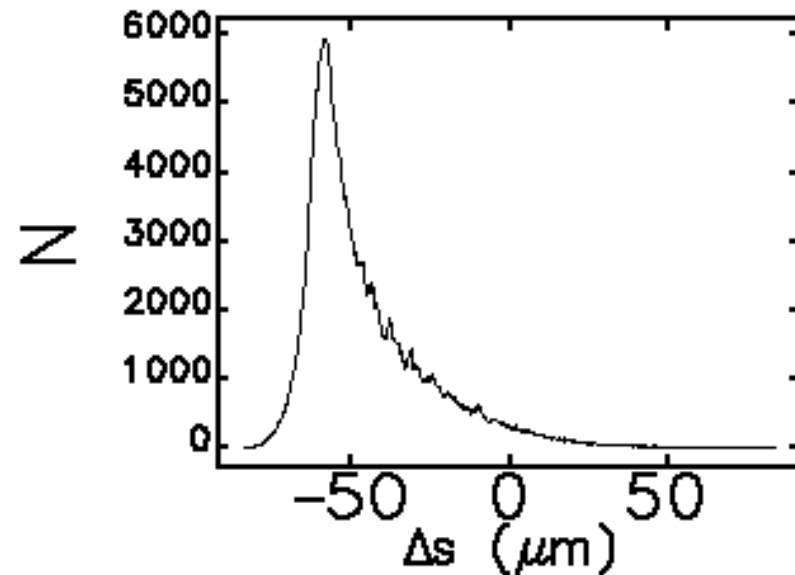
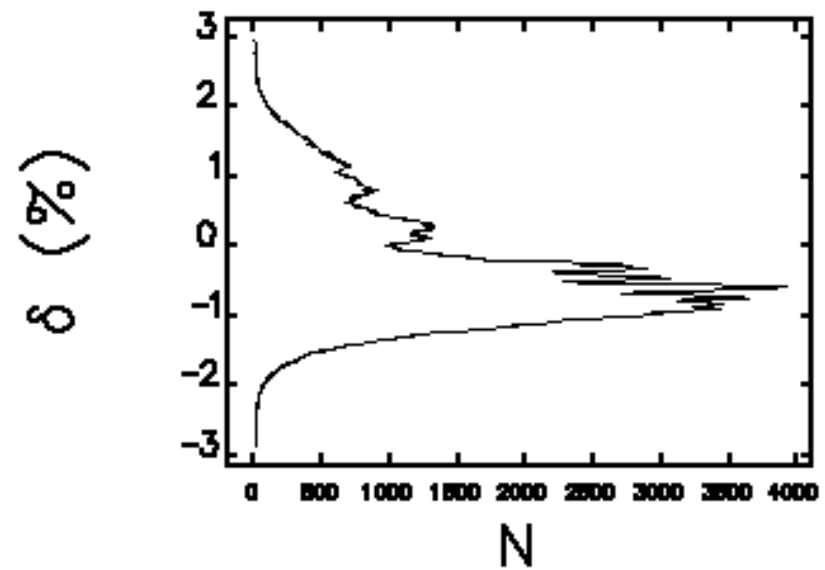
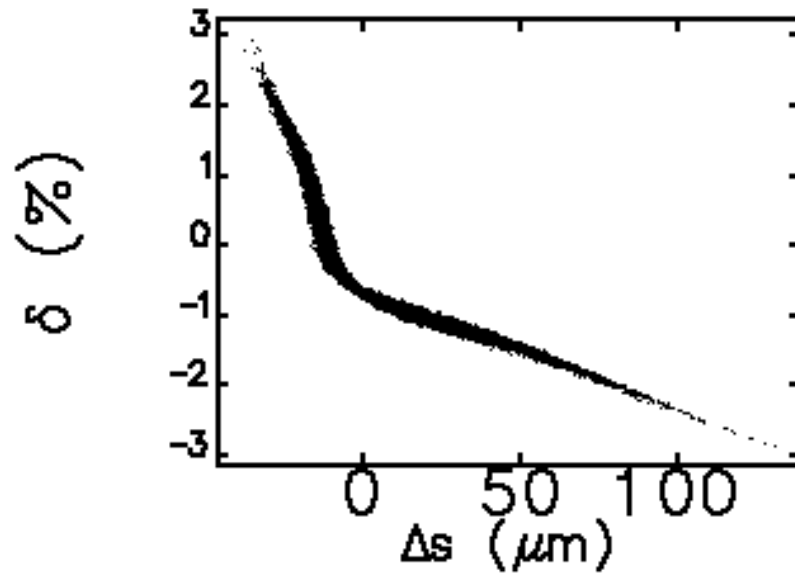
- Standard chicane compressor has $R_{56} < 0$
- To make a similar compressor with $R_{56} > 0$
 - Same sign for all dipoles
 - Add focusing quadrupole between B2 and B3
 - Adjust lengths (slightly) and quadrupole to give
 - Same $|R_{56}|$
 - $R_{16} = 0$ and $R_{26} = 0$ at end
 - Adjust initial Twiss parameters to get the same Twiss parameters at exit of B4

$R_{56} > 0$ Compressor Design



0.5GeV, 1.0nC, Gaussian Beam

$R_{56} > 0$ Compressor, B4 Exit



Case: withCSR-0.5GeV-GC-1.0nC

Location: B4-exit

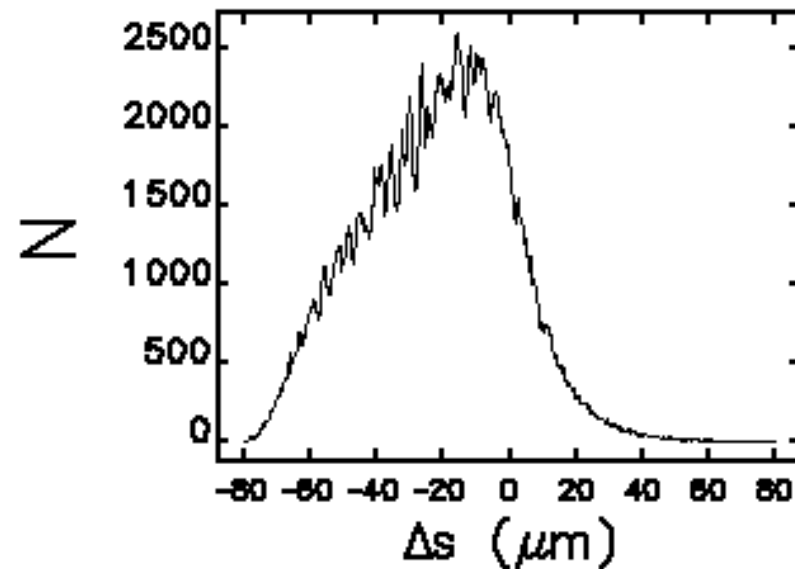
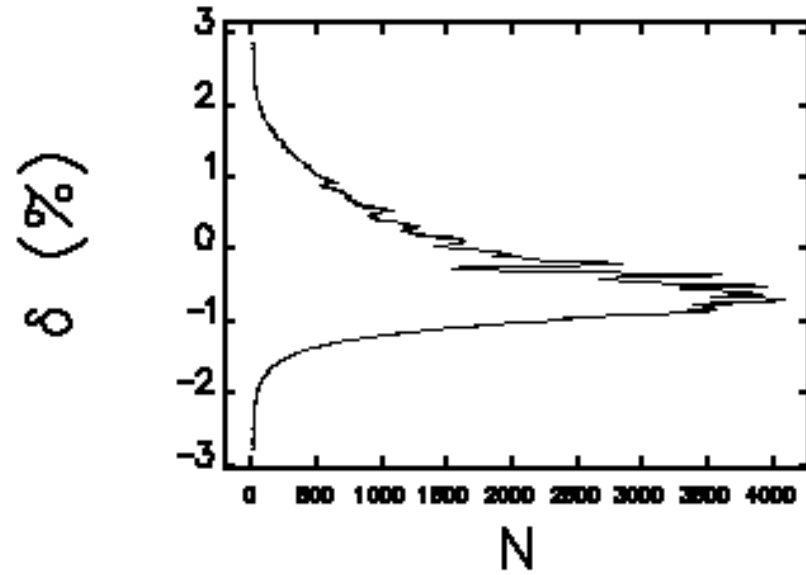
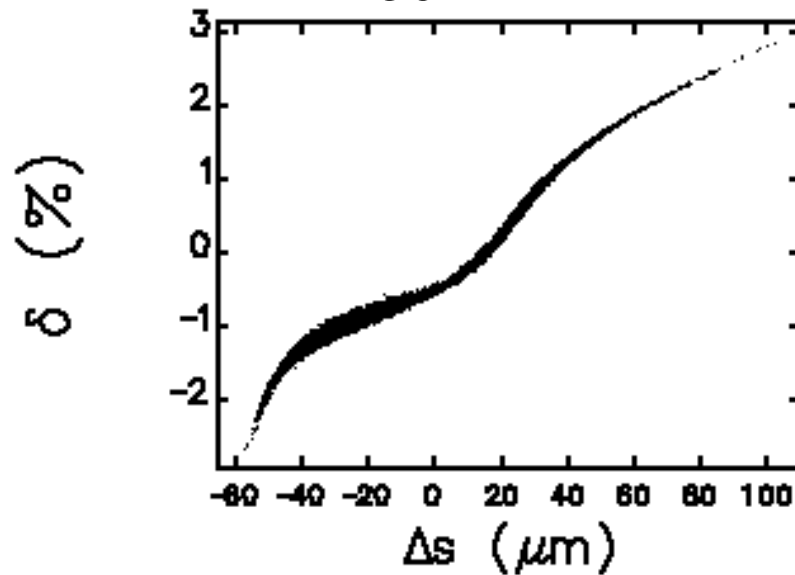
$\langle \delta \rangle = -0.3082\%$

$SD(\delta) = 0.8009\%$

$SD(\Delta s) = 19.3197 \mu\text{m}$

0.5GeV, 1.0nC, Gaussian Beam

$R_{56} < 0$ Compressor, B4 Exit



Case: withCSR-0.5GeV-GC-1.0nC

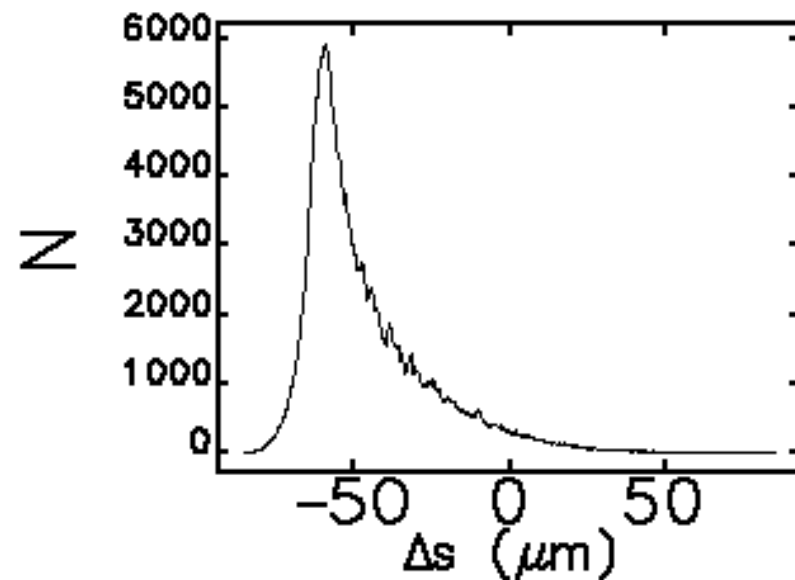
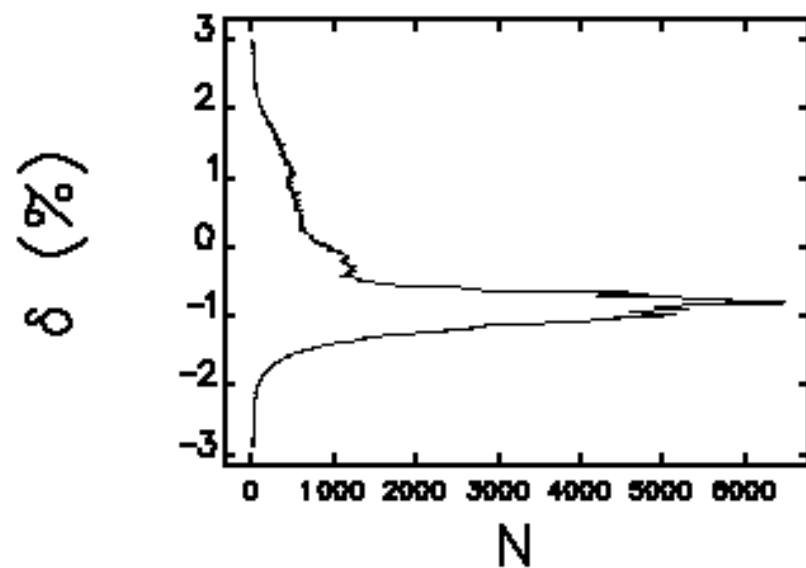
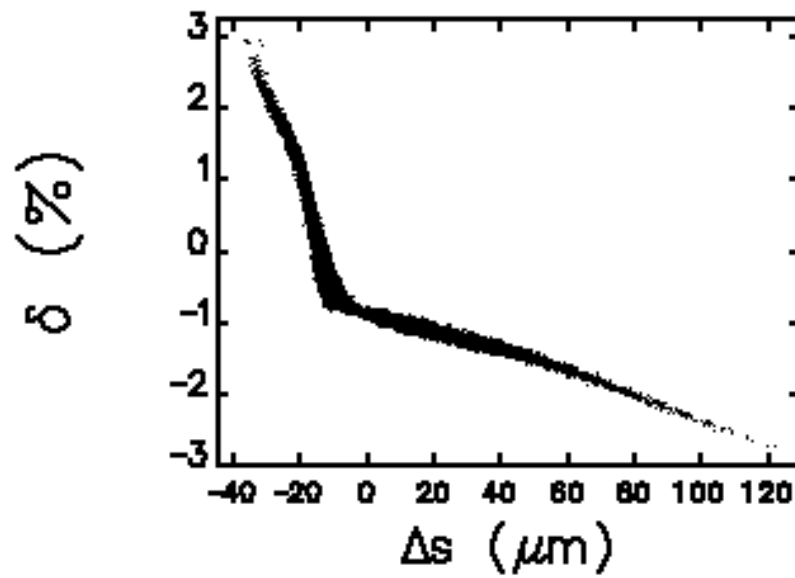
Location: B4-exit

$\langle \delta \rangle = -0.3098\%$

$SD(\delta) = 0.6776\%$

$SD(\Delta s) = 22.0121 \mu\text{m}$

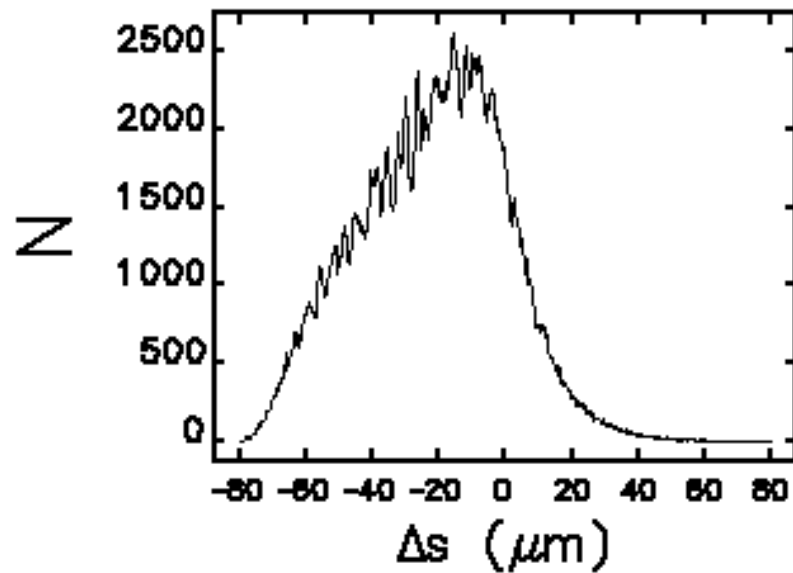
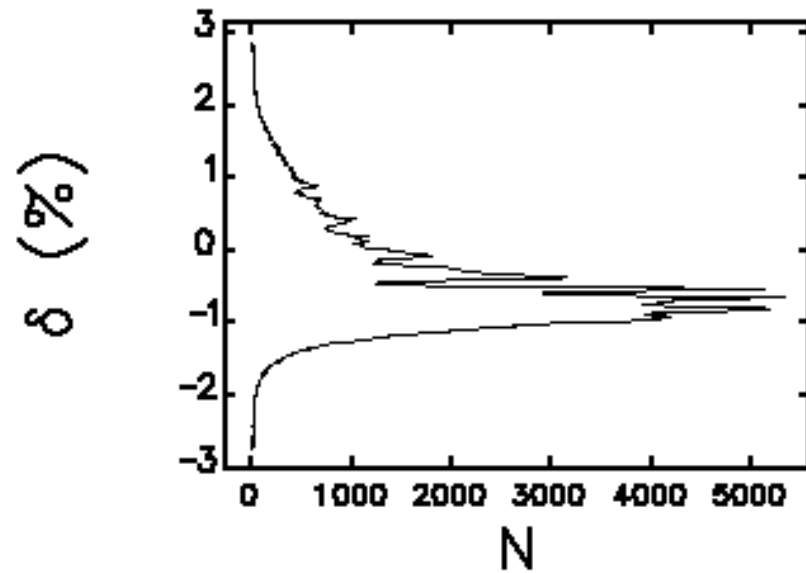
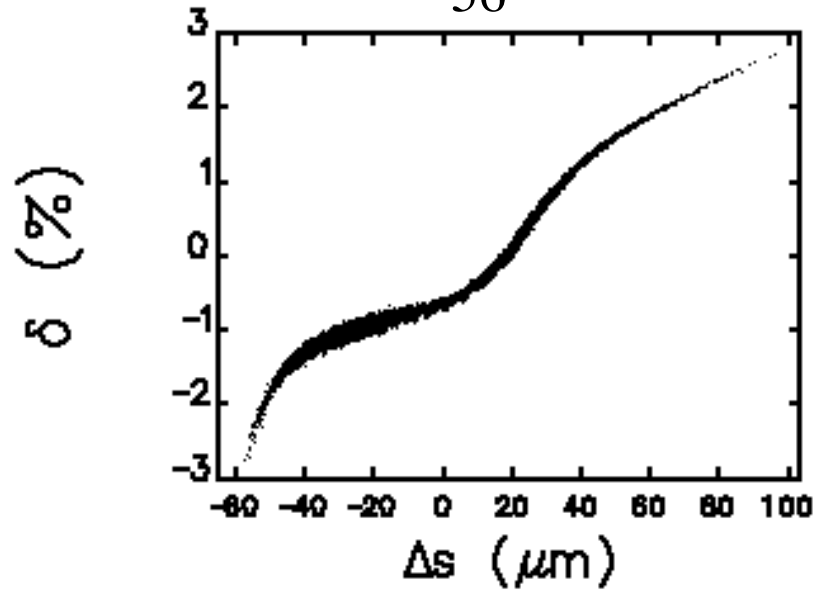
0.5GeV, 1.0nC, Gaussian Beam $R_{56} > 0$ Compressor, End



Case: withCSR-0.5GeV-GC-1.0nC
Location: end
 $\langle \delta \rangle = -0.5252\%$
 $SD(\delta) = 0.7658\%$
 $SD(\Delta s) = 19.2600 \mu\text{m}$

0.5GeV, 1.0nC, Gaussian Beam

$R_{56} < 0$ Compressor, End



Case: withCSR-0.5GeV-GC-1.0nC

Location: end

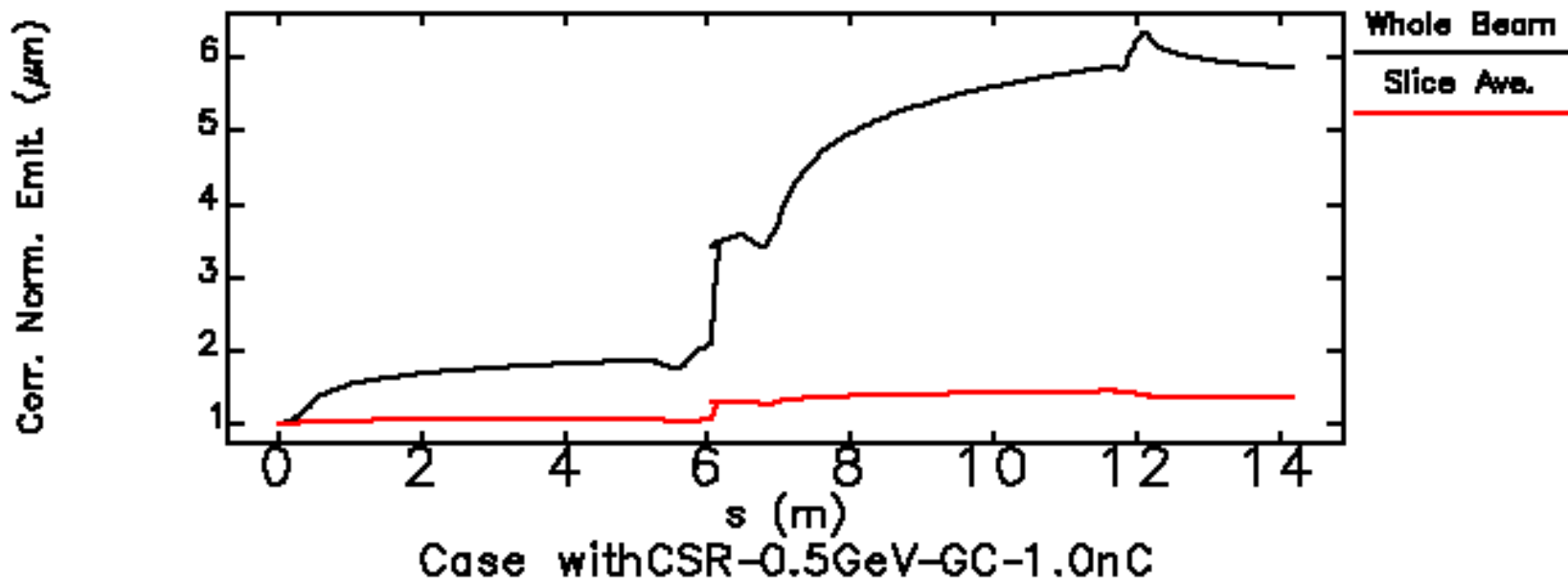
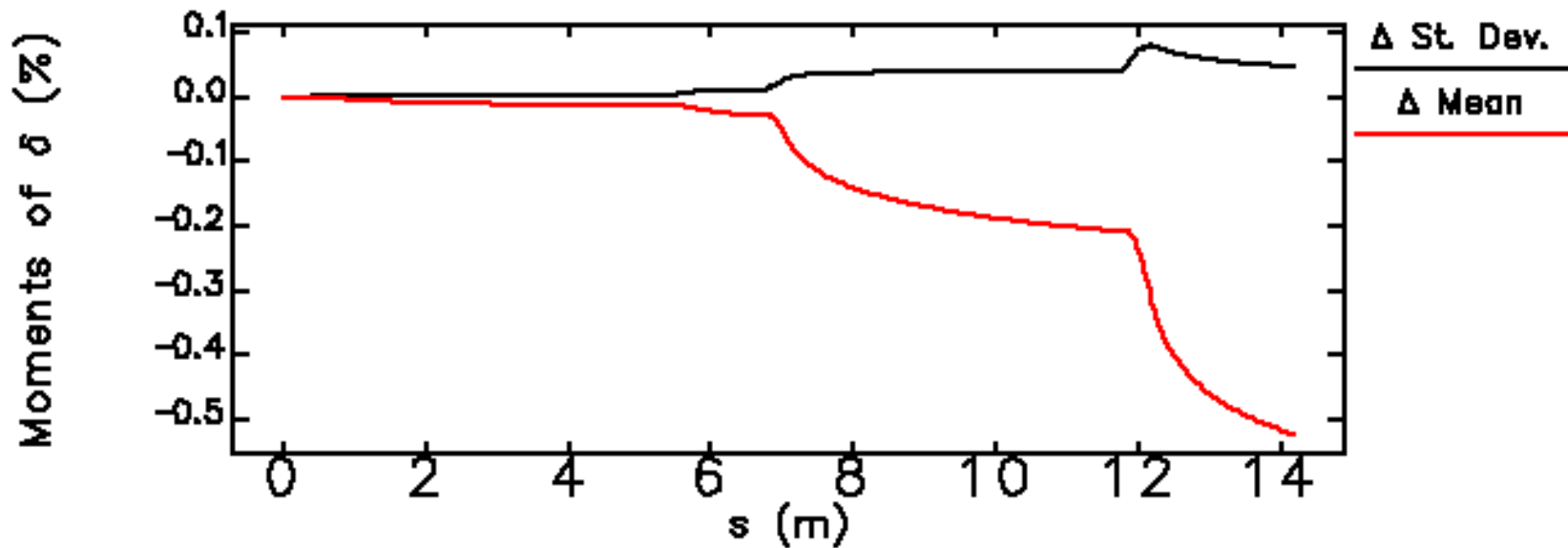
$\langle \delta \rangle = -0.4215\%$

$SD(\delta) = 0.6709\%$

$SD(\Delta s) = 21.9233 \mu\text{m}$

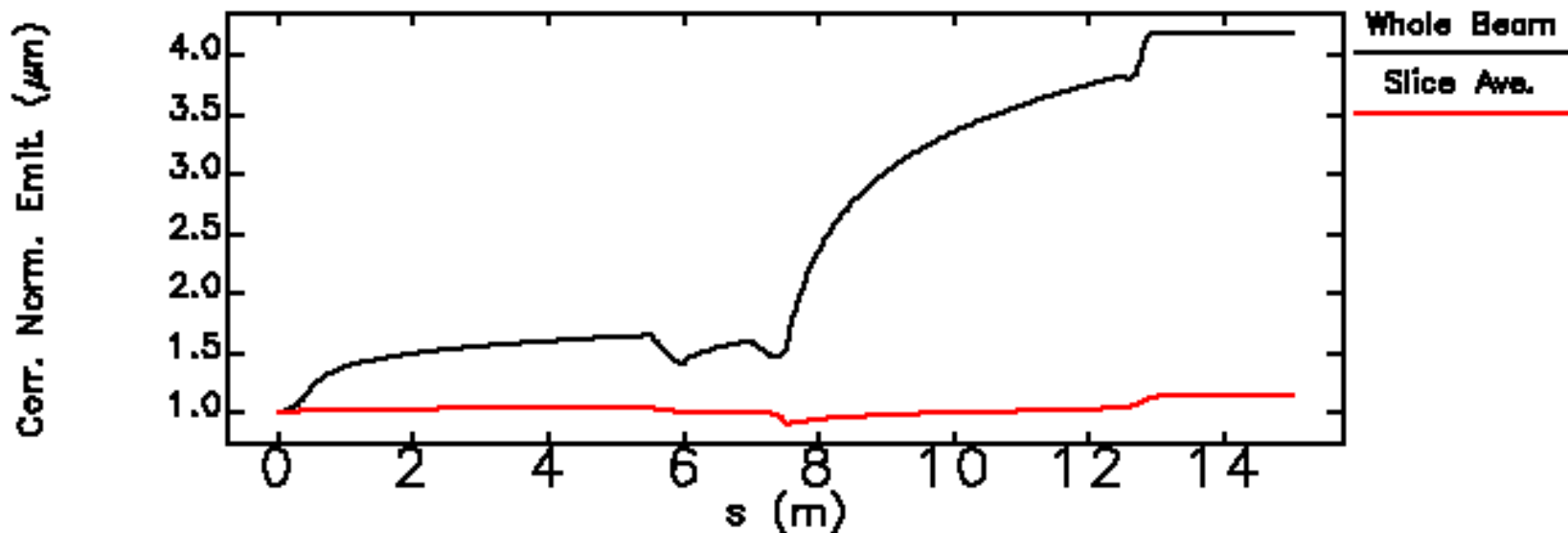
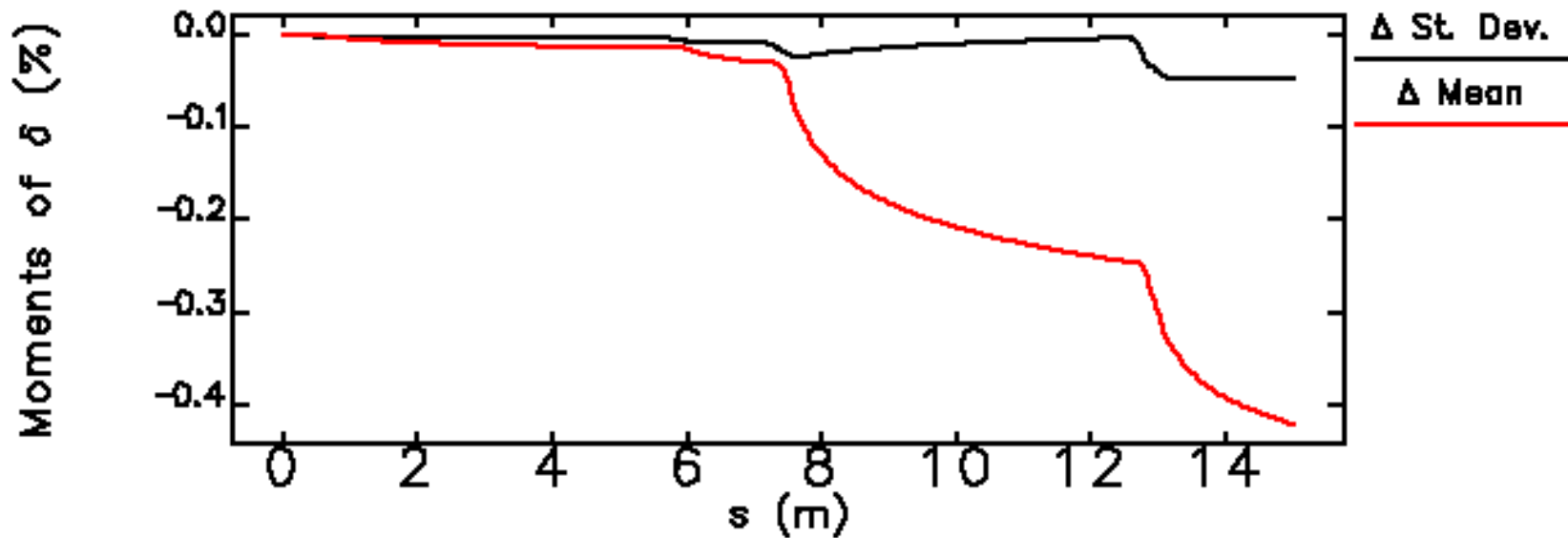
0.5GeV, 1.0nC, Gaussian Beam

$R_{56} > 0$ Compressor



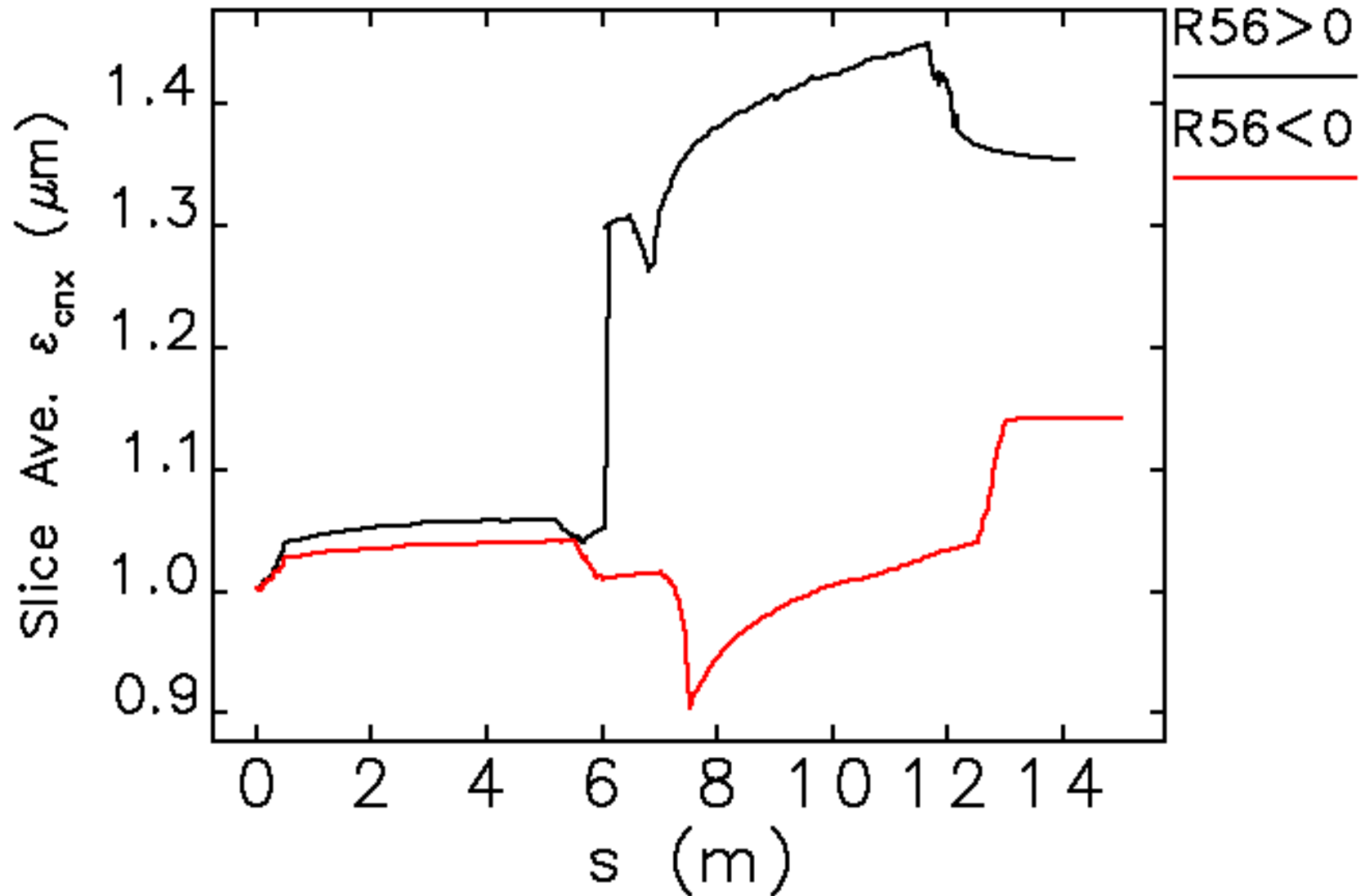
0.5GeV, 1.0nC, Gaussian Beam

$R_{56} < 0$ Compressor



Case with CSR-0.5GeV-GC-1.0nC

0.5GeV, 1.0nC, Gaussian Beam



Conclusions

- System with $R_{56} > 0$ is not clearly better
 - Instability less evident at the exit
 - Final beam properties not as good
- Practically, would have problems with removing the residual energy spread using wakes