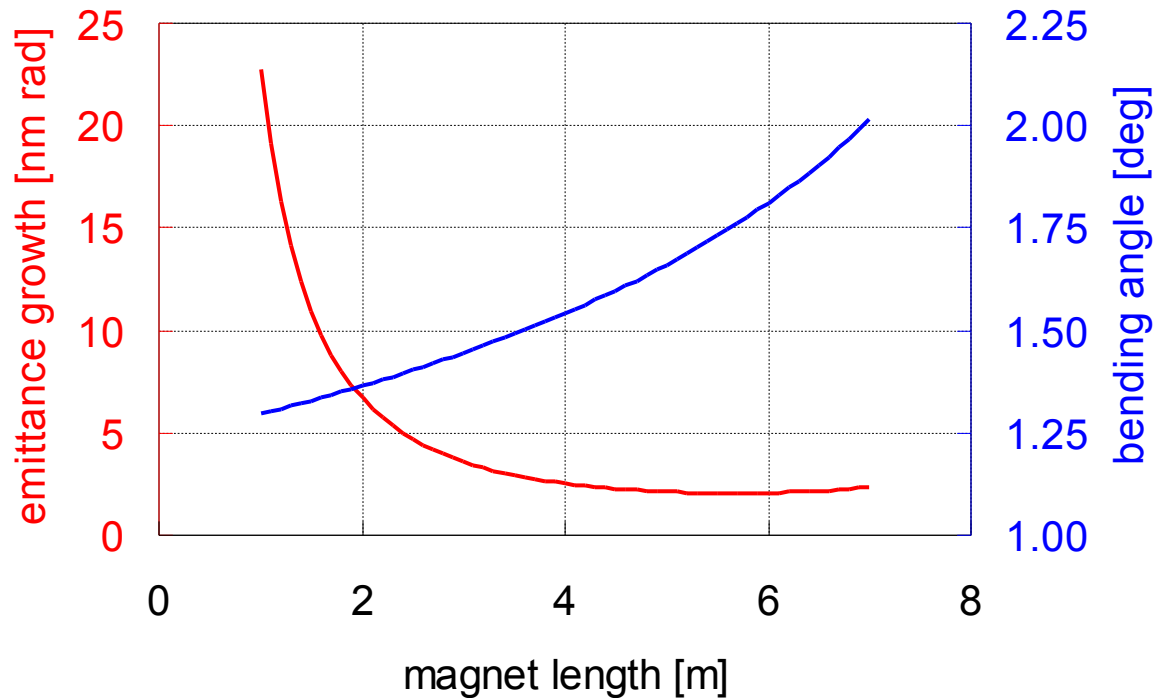
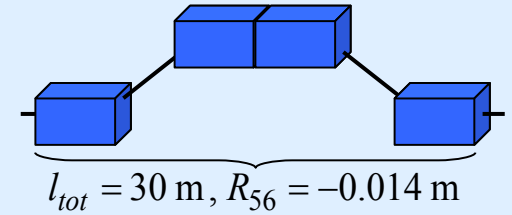


Options for the second CLIC Main LINAC Chicane

- Influence of dipole length on ISR and CSR
- Comparison of different chicanes
- Conclusions and Plans

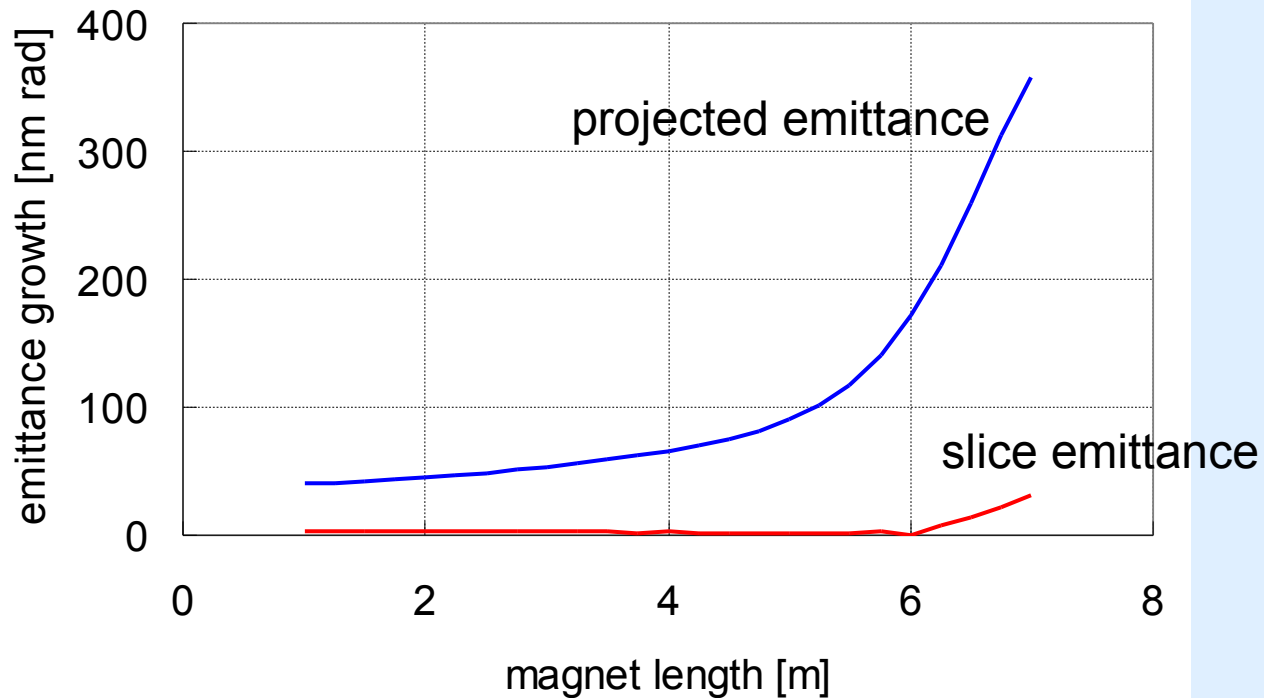
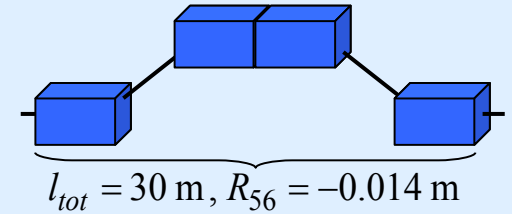
- for details see EUROTeV-Report-2006-016
(in review)

Incoherent Synchrotron Radiation



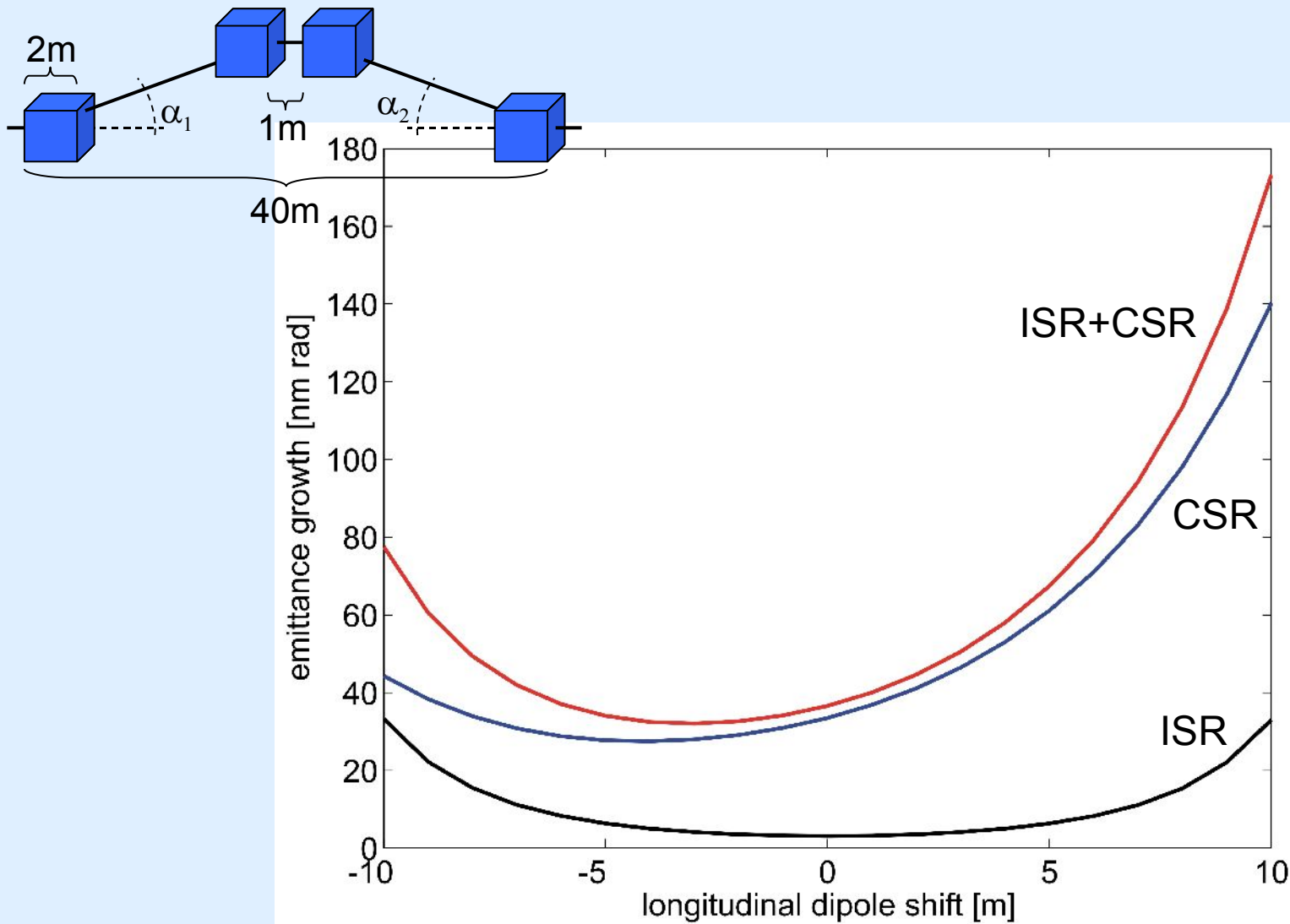
emittance growth vs. magnet length

Coherent Synchrotron Radiation

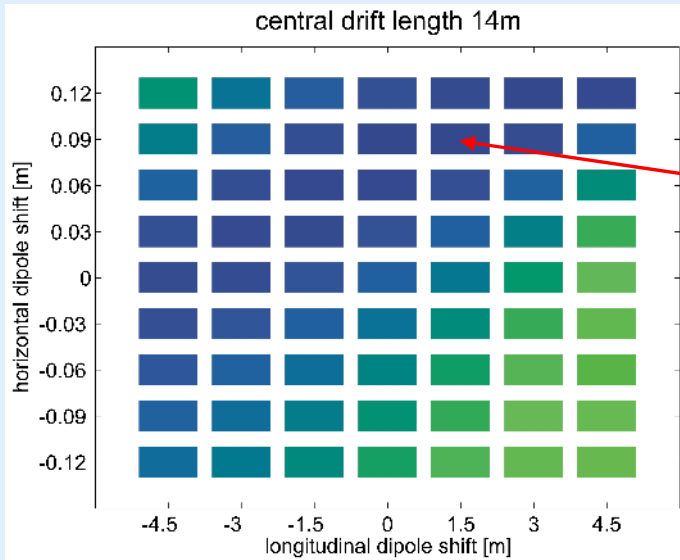
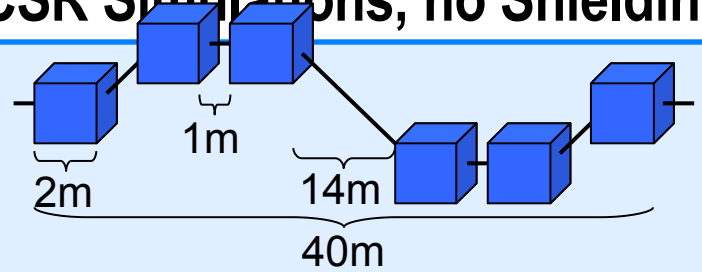


emittance vs. magnet length

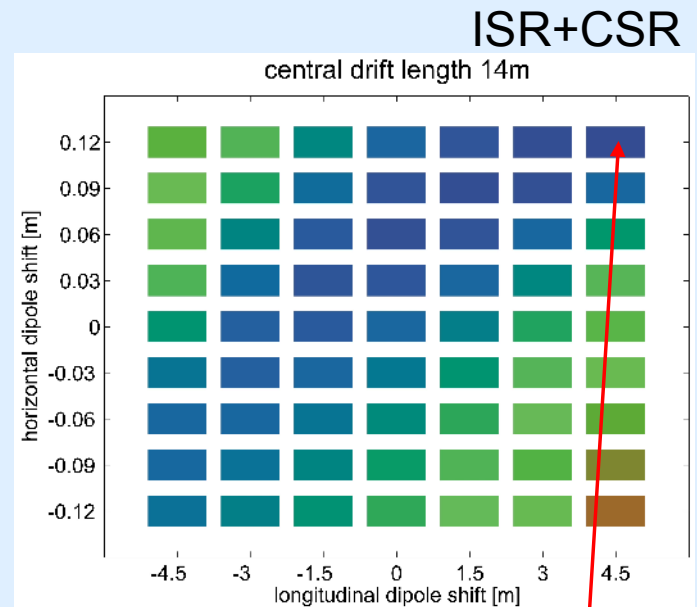
1D CSR Simulations, no Shielding



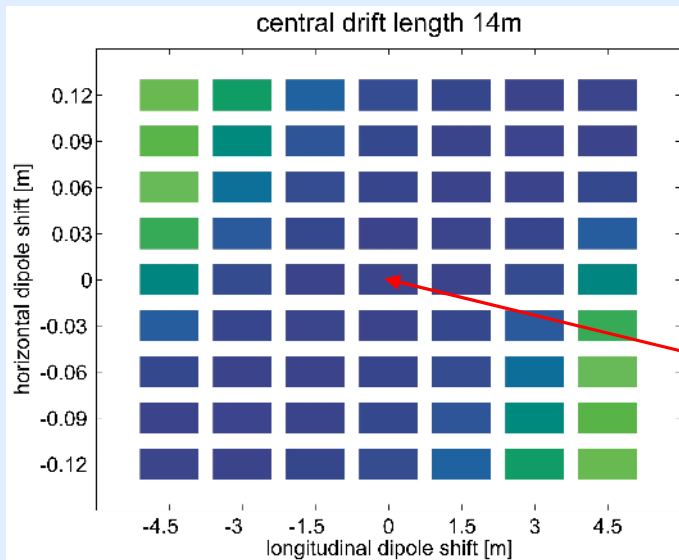
1D CSR Simulations, no Shielding



CSR
10.5 nm rad



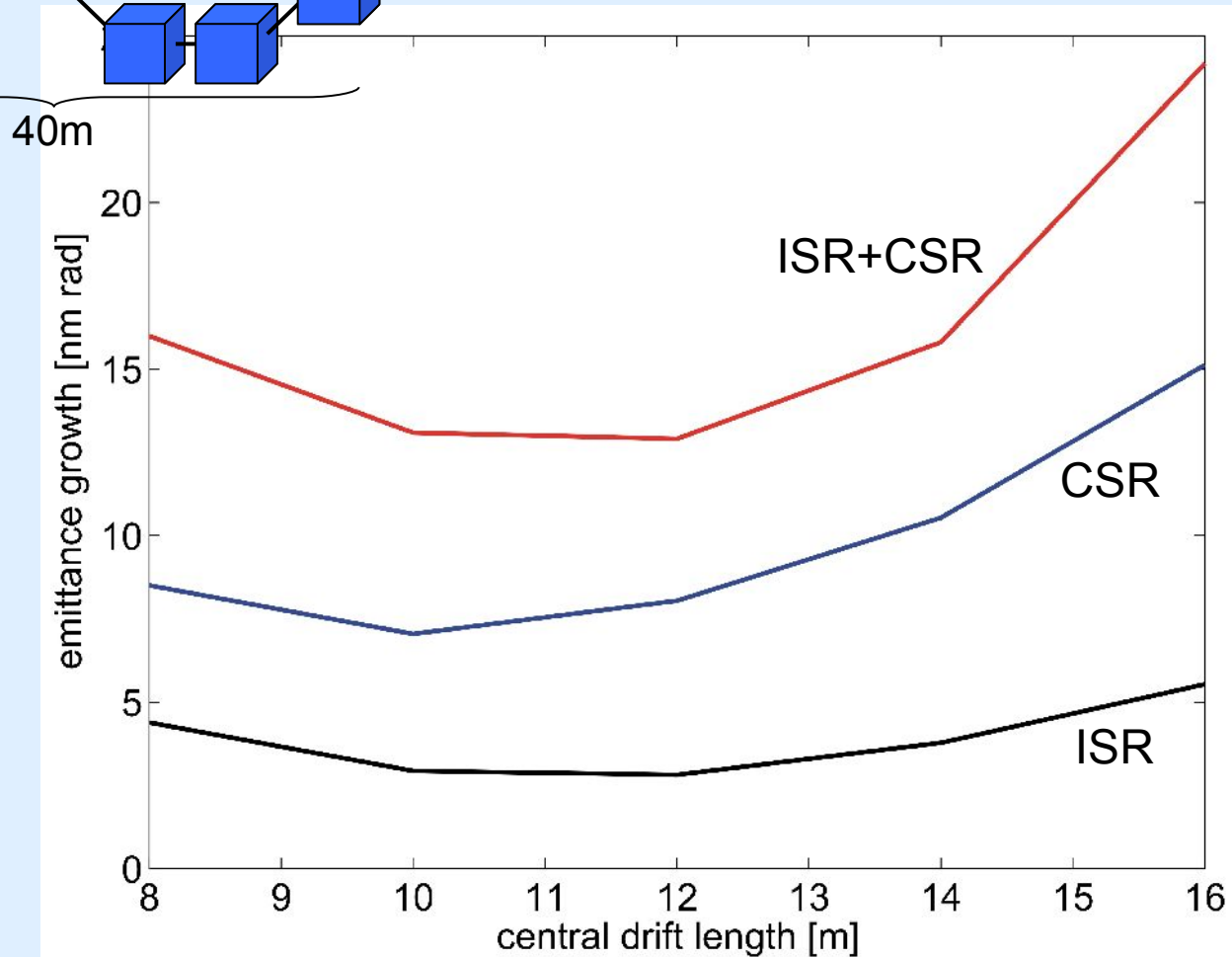
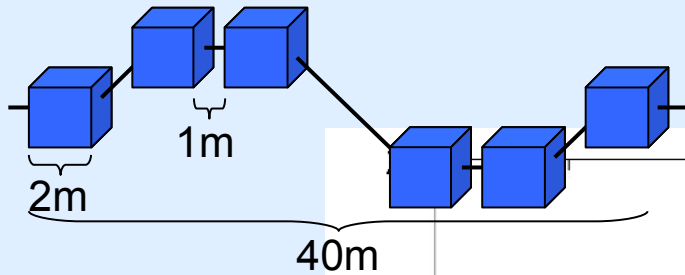
15.8 nm rad



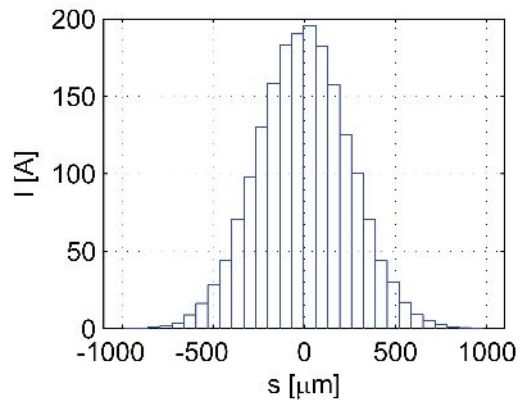
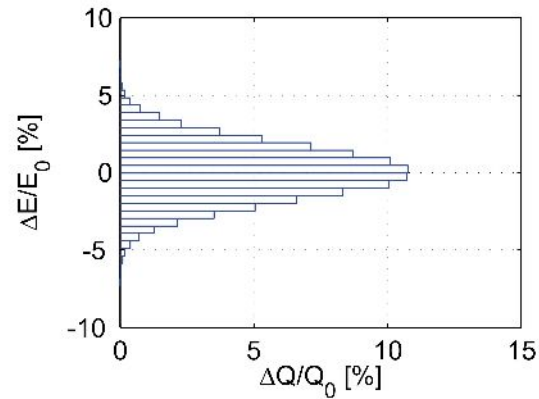
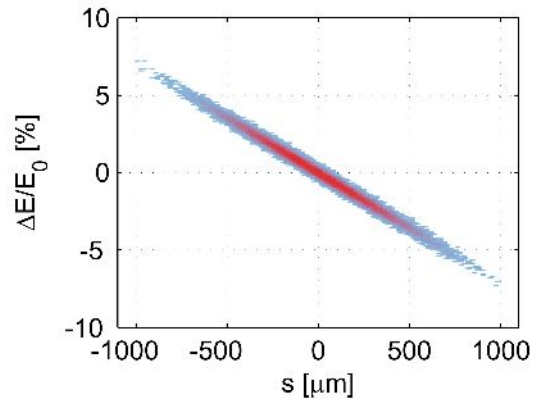
3.8 nm rad

ISR

1D CSR Simulations, no Shielding



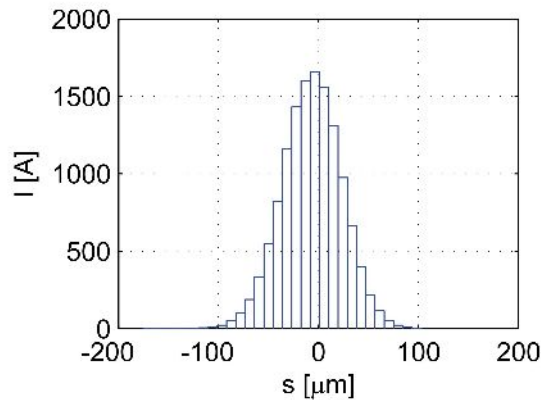
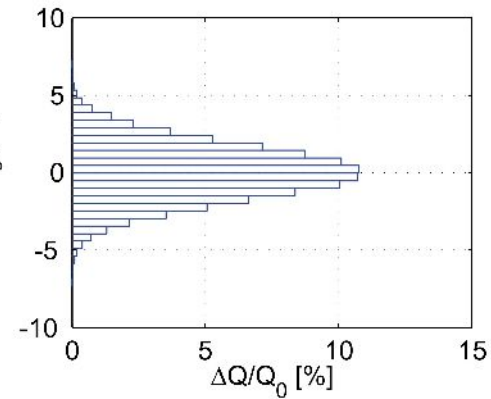
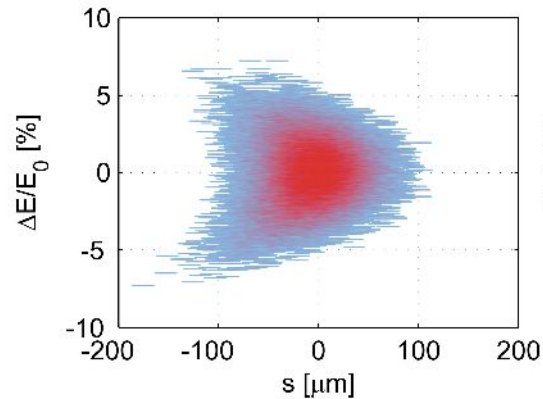
- The goal of a maximum emittance growth of 30 nm rad can be reached in either C- or S-chicanes (30 nm rad vs. 15 nm rad)
- S-chicanes give better results
- Optics functions have to be optimized (almost finished, emittance growth reduced by up to 10 nm rad)
- Shielding due to vacuum chamber will be studied
- Resistive wall wakes must be considered
- Error tolerances must be checked



Position s [m]= 0.001
 peak current I [A]= 196
 bunch length σ_{rms} [μm]= 249.5

energy spread
 total $(\Delta E/E)_{\text{rms}}$ [%]= 1.782
 slice $(\Delta E/E)_{\text{rms}}$ [%]= 0.1947

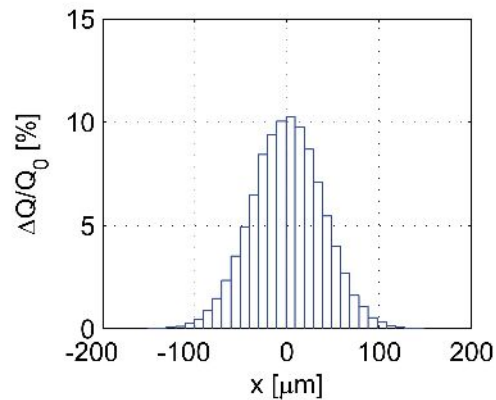
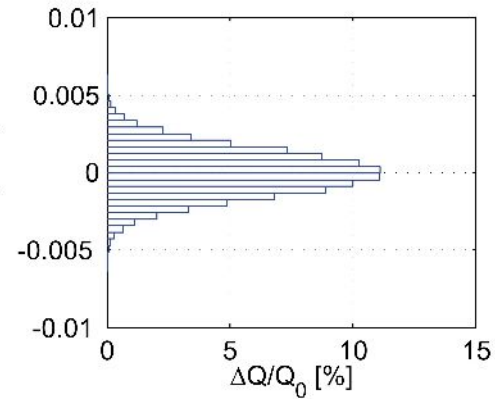
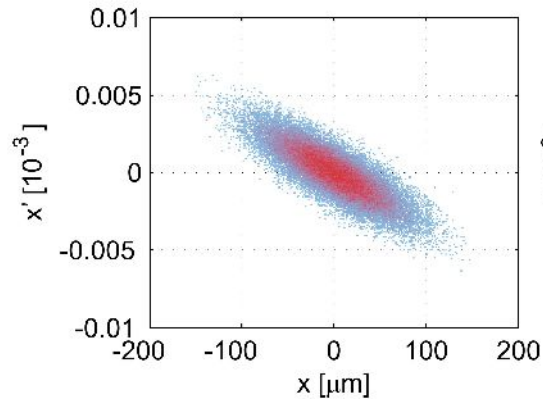
initial longitudinal phase space



Position s [m]= 42.01
 peak current I [A]= 1658
 bunch length σ_{rms} [μm]= 29.55

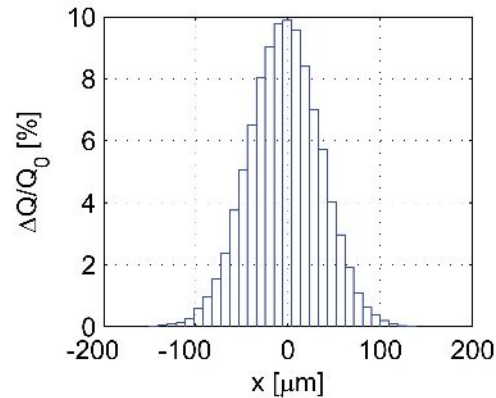
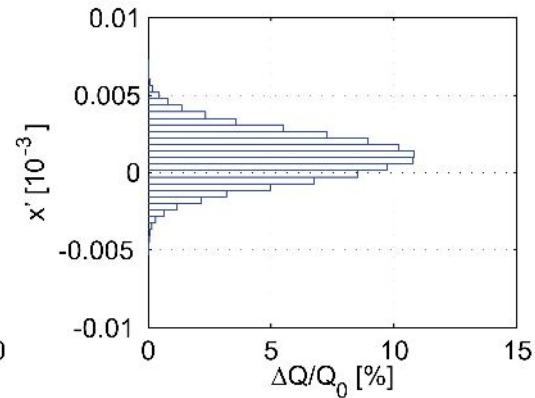
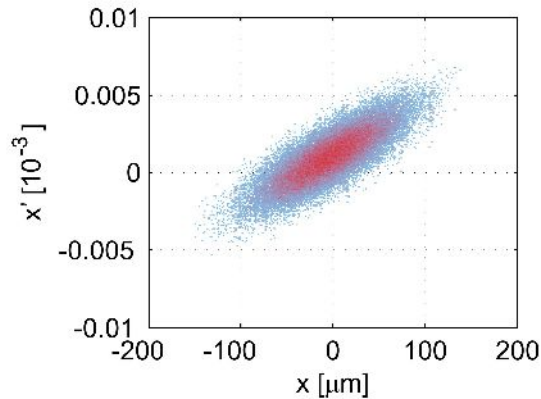
energy spread
 total $(\Delta E/E)_{\text{rms}}$ [%]= 1.782
 slice $(\Delta E/E)_{\text{rms}}$ [%]= 1.656

final longitudinal phase space (almost the same for all chicanes)



Position s [m]= 0.001
 beta [m]= 45.073
 alpha [m]= 1.4589
 norm. proj. emit. [mm mrad]= 0.57361
 norm. corr. emit. [mm mrad]= 0.00063179
 norm. slice emit. [mm mrad]= 0.56711
 rms x [μm]= 38.3127
 mean x [μm]= 0.34404
 rms x' [10^{-3}]= 0.0015034
 mean x' [10^{-3}]= -1.3183e-05

initial transverse phase space



Position s [m]= 42.01
 beta [m]= 42.7601
 alpha [m]= -1.387
 norm. proj. emit. [mm mrad]= 0.60451
 norm. corr. emit. [mm mrad]= 0.0049376
 norm. slice emit. [mm mrad]= 0.57087
 rms x [μm]= 38.3087
 mean x [μm]= -3.6114
 rms x' [10^{-3}]= 0.0015319
 mean x' [10^{-3}]= 0.0010232

final transverse phase space (one example, but similar for all chicanes)