

TTF2-s2e

ASTRA-Generator

ASTRA

mcad: "00_astra_to_bc1_in"

CSRtrack

mcad: "05_fmt3_to_astra"

ASTRA

mcad: "06_astra_to_bc2_in"

CSRtrack

mcad: "07_fmt3_to_astra"

ASTRA

→ GAUSS200000_Q1P0nCXYrms0P75mm4p4ps.ini

→ TTF2_09APR05_ACC1m9deg_200K.1350.001

→ before_bc1_9deg.fmt1

→ end_10000.fmt3

→ x_9deg.ini

→ x_9deg.out

→ before_bc2_9deg.fmt1

→ end_10000.fmt3

→ y_9deg.ini

→ y_9deg.out

mcad: add wakes

GENESIS

3 particle formats

(serial) ASTRA runs ~ 0.5 d + 0.5d +0.75d

(1d) CSRtrack ~ 1h + 2h

ASTRA

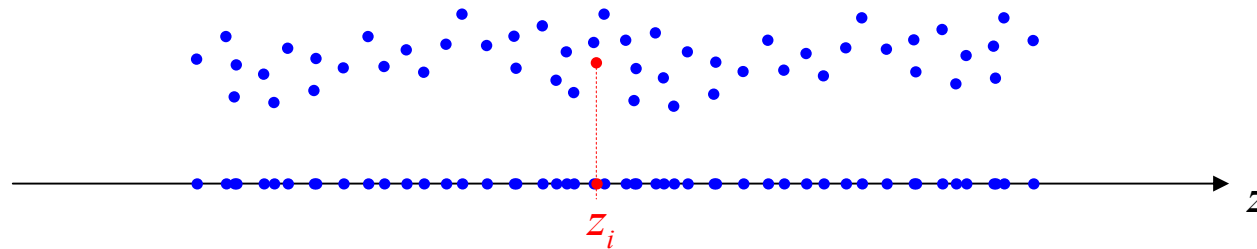
differences between serial- and MPI-version → use serial version
convergence tests missing; so far: Nrad=10, Nlong_in=15 for GUN & ACC1
Nrad=30, Nlong_in=300 for the rest

CSRtrack

1d-method: 1-ASTRA particle → 1-CSRtrack particle
new filter technique: position averaging + sub-bunch (as before)

1d filtering in CSRtrack

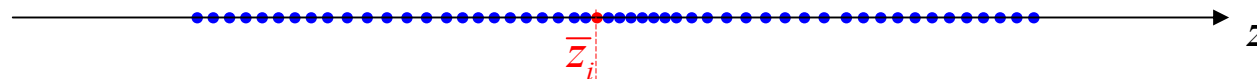
distribution of **equi-charged** particles:



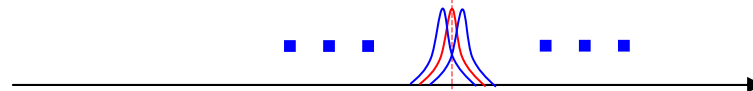
M -particle position averaging:

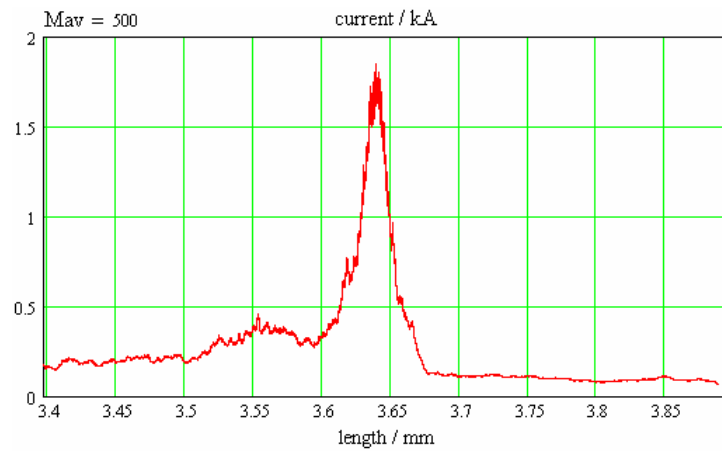
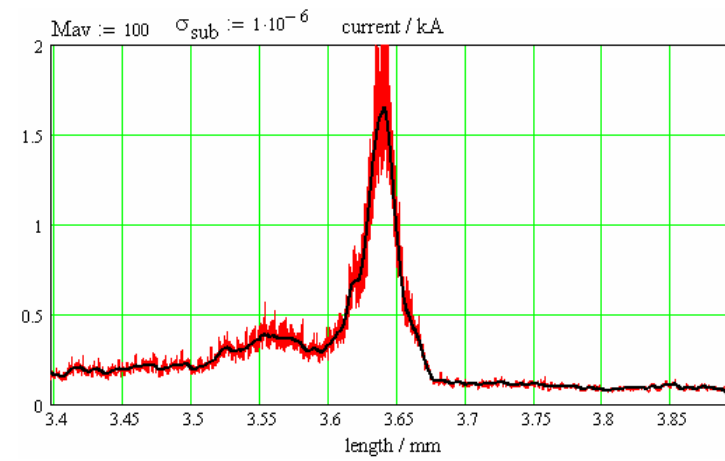
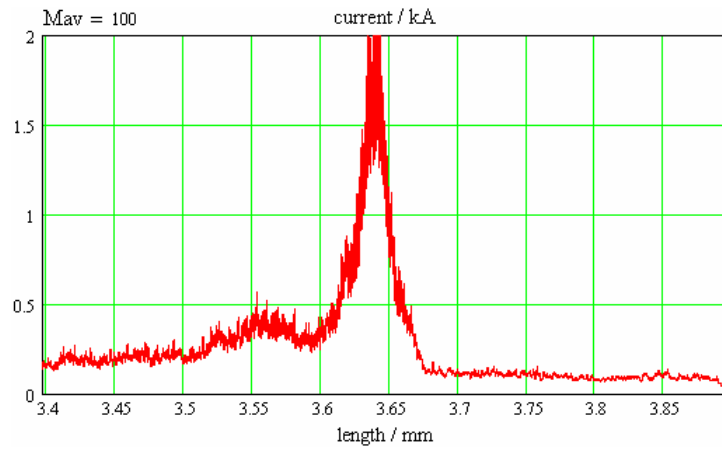
$$M := 1 + 2M_h$$

$$\bar{z}_i := \frac{1}{M} \sum_{i-M_h}^{i+M_h} z_i$$

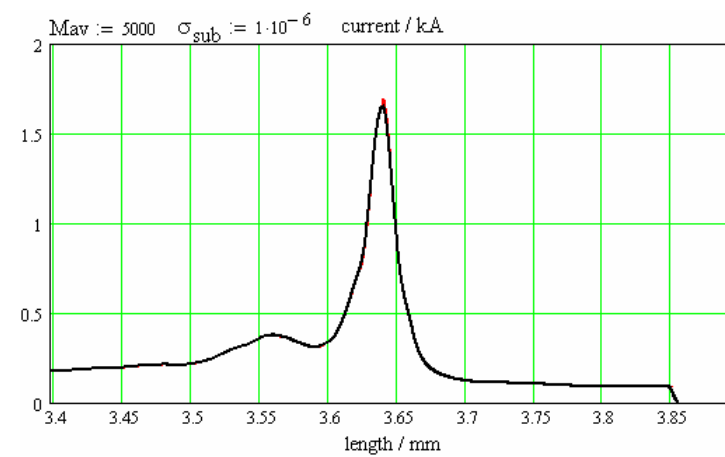
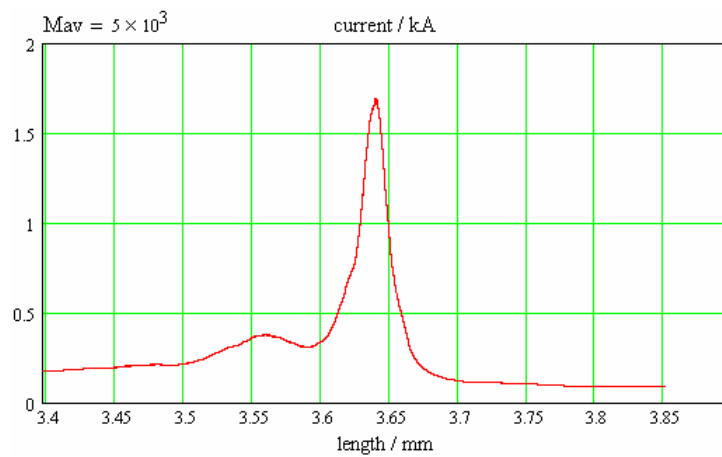


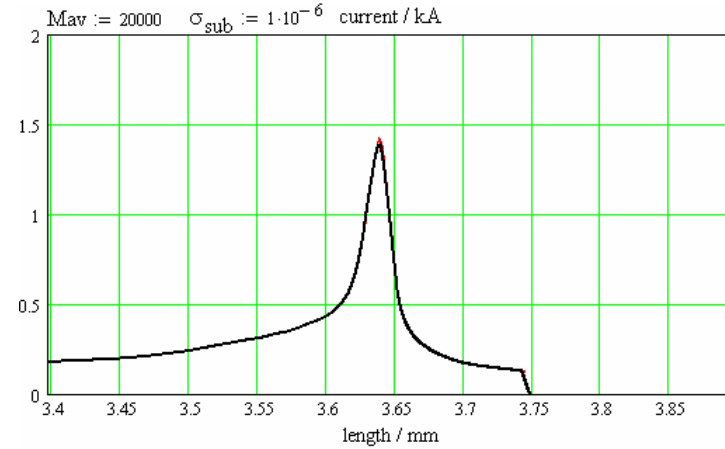
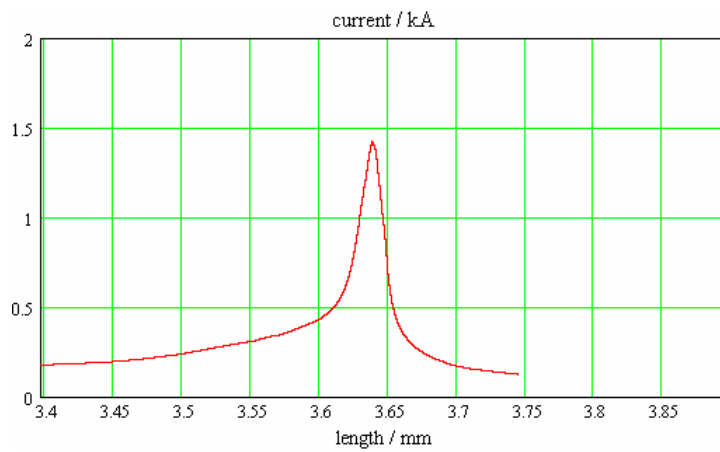
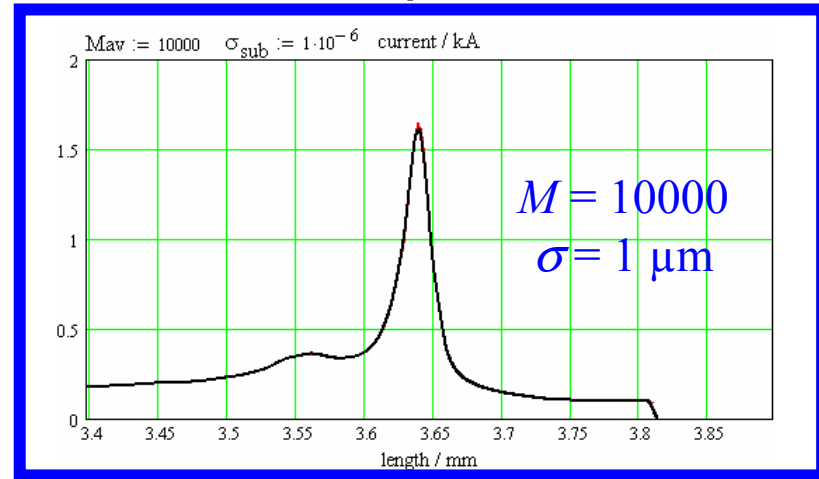
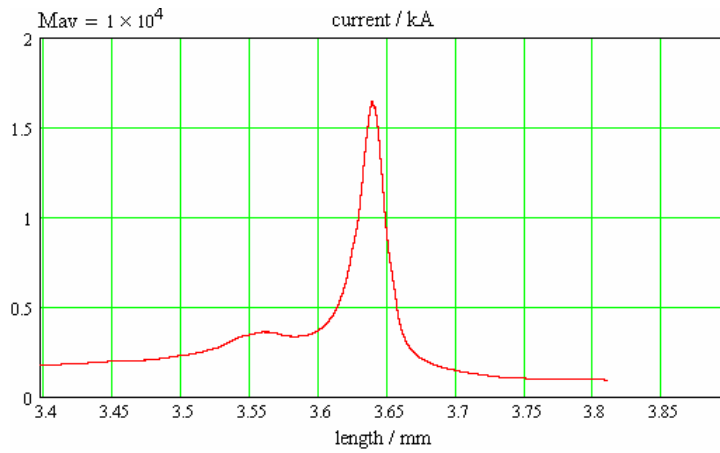
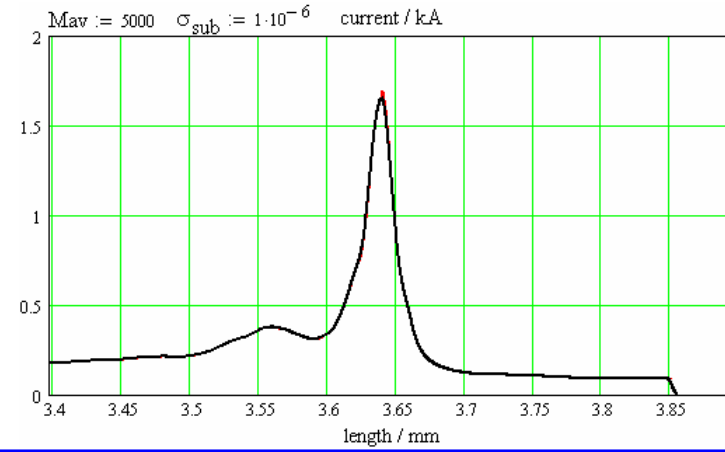
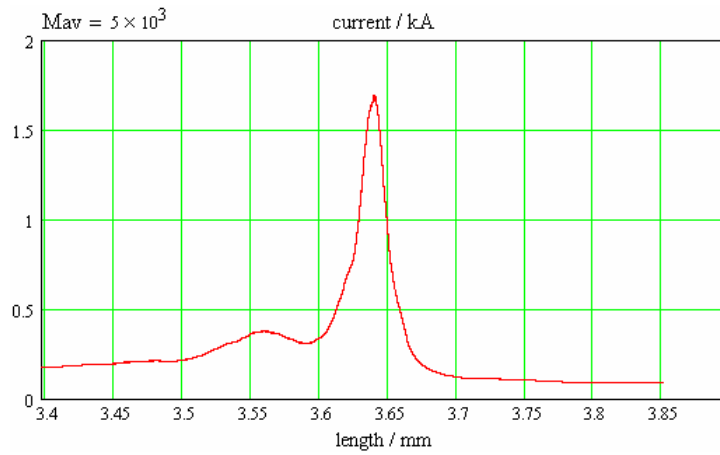
& convolution with Gaussian sub-bunch with rms-length = σ





200000 particles





sub-bunch length

BC2

BC3

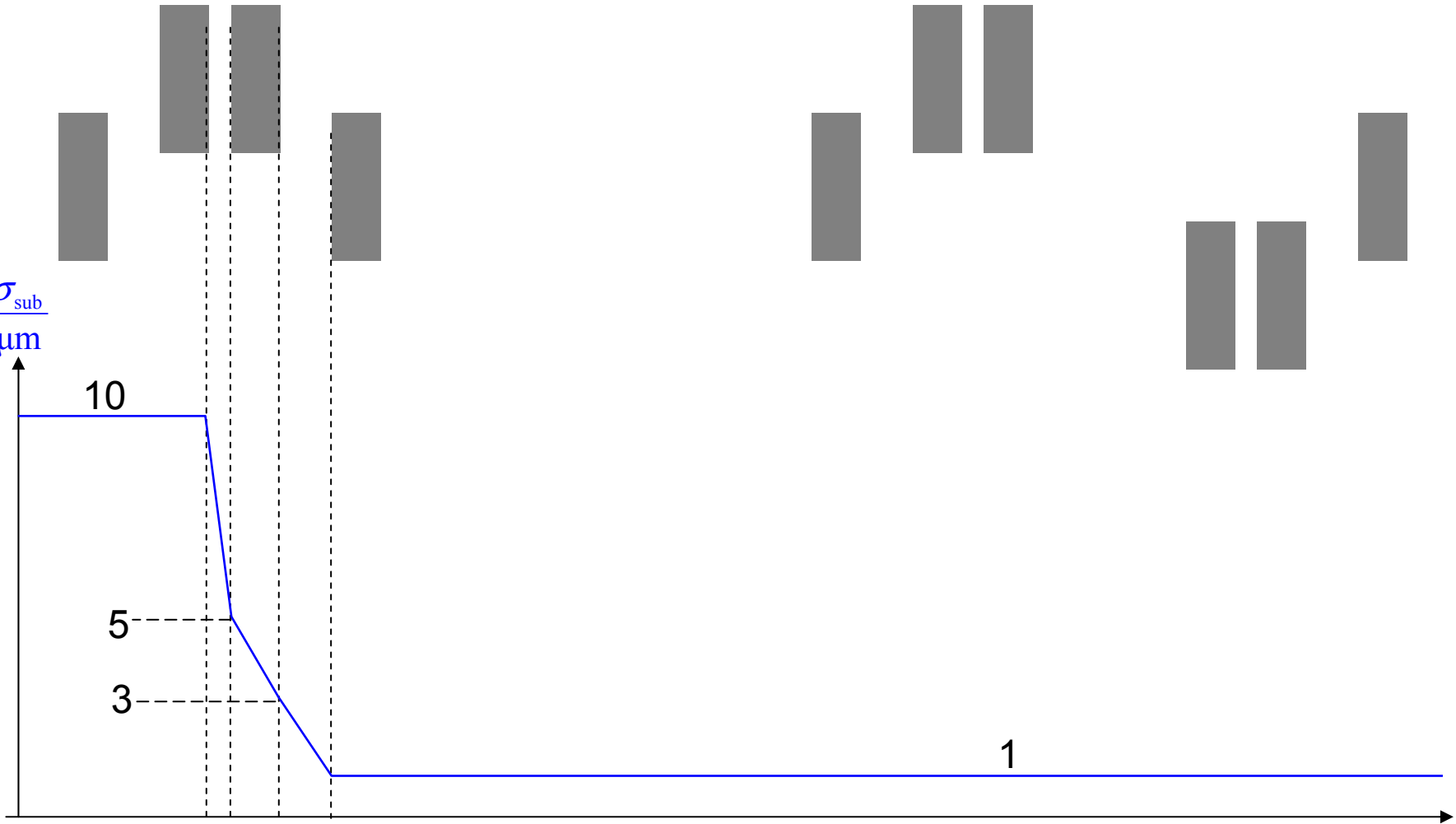
$\frac{\sigma_{\text{sub}}}{\mu\text{m}}$

10

5

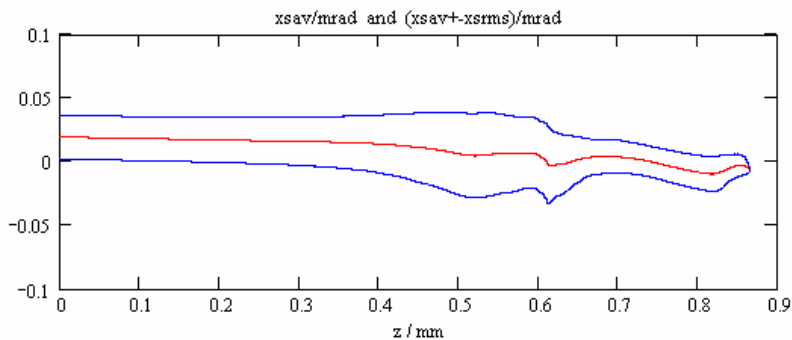
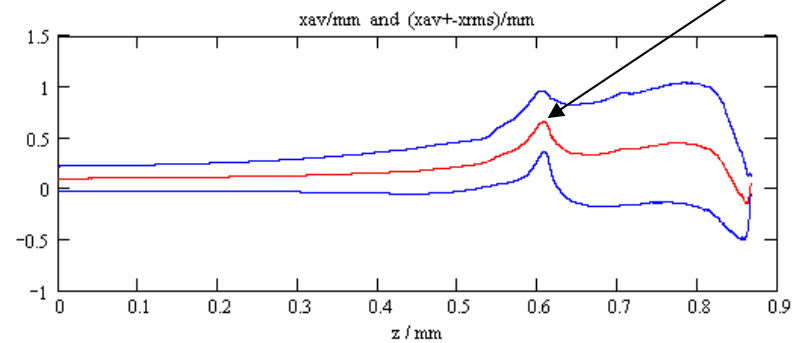
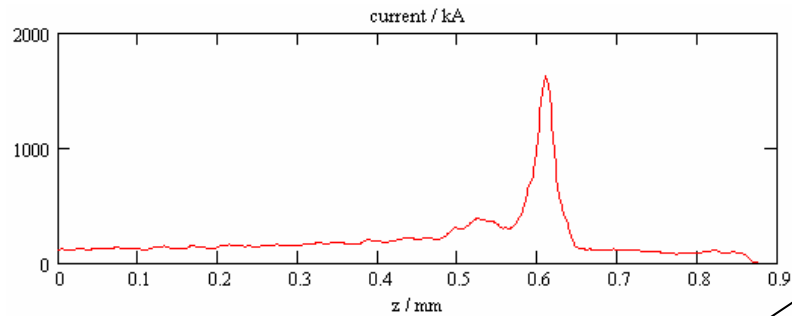
3

1



after BCs: centroid extraction

proposed by E. Schneidmiller



offset of slice with
peak current

ASTRA: monopole
charge density



SC effects underestimated

to avoid that:
shift centroids to center

more: s2e_TTF2_06oc05_B.pdf

Microsoft PowerPoint - [s2e_TTF2_05oc05_B.ppt]

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before BC2

after BC2

before BC3

after BC3
without SC between BCs

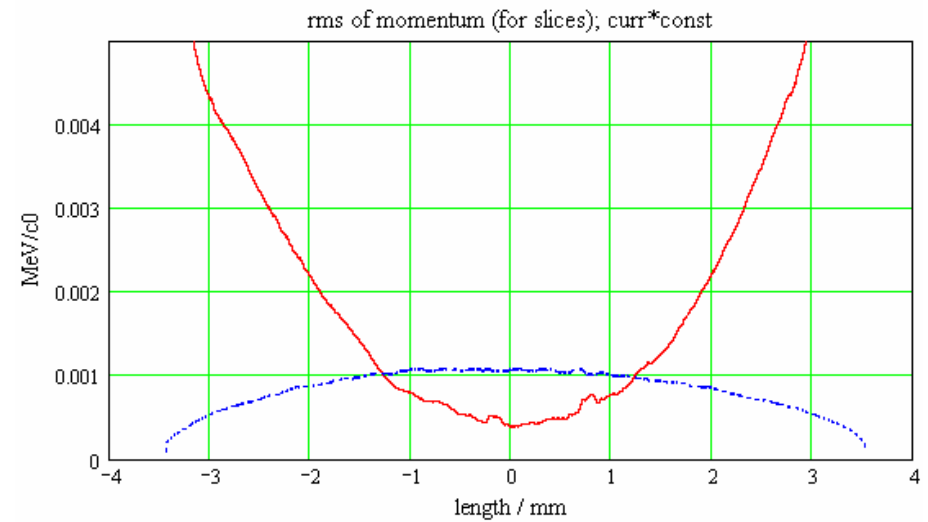
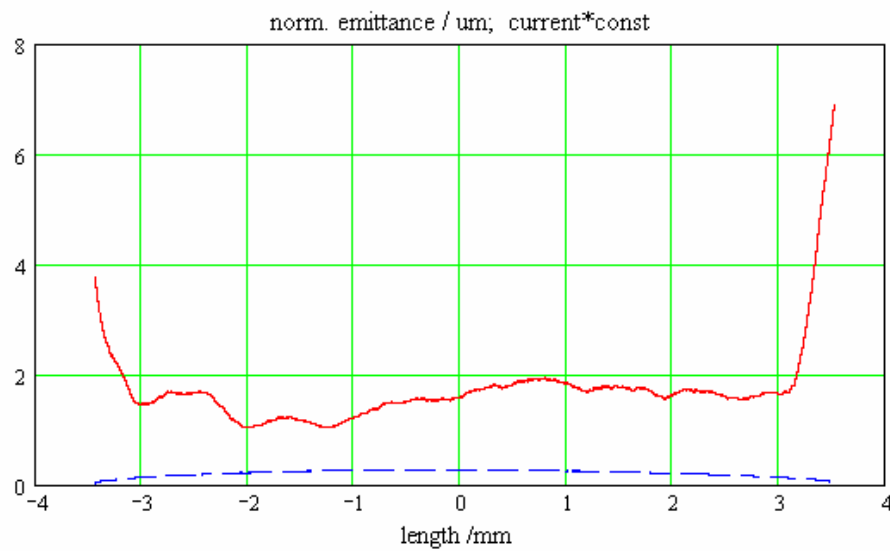
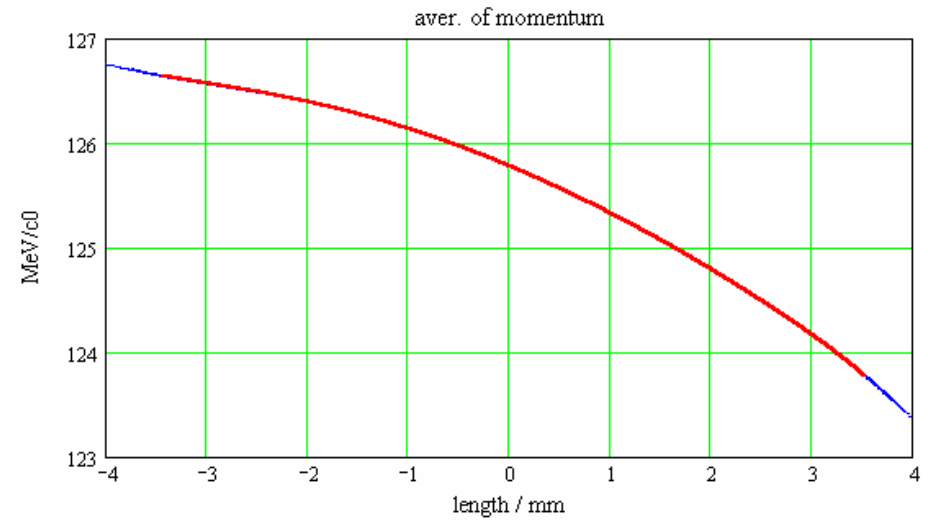
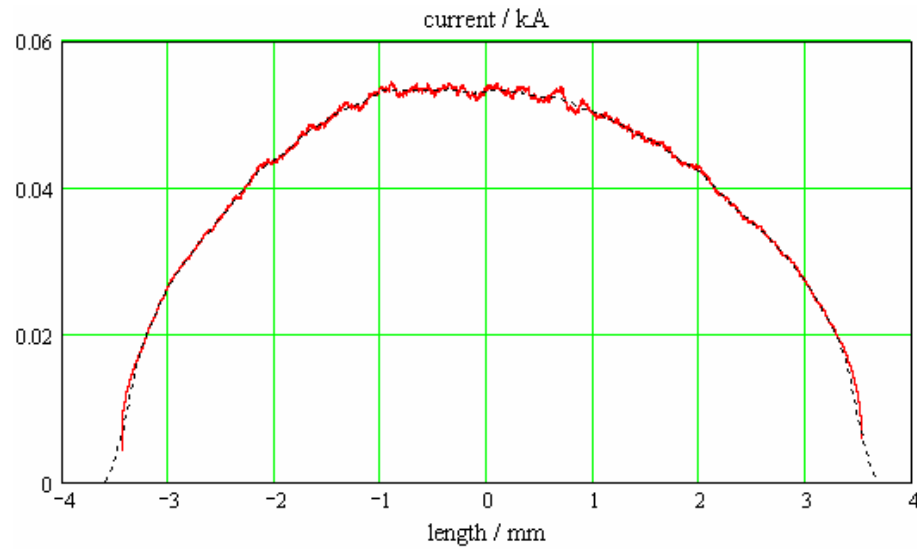
after BC3

155 m

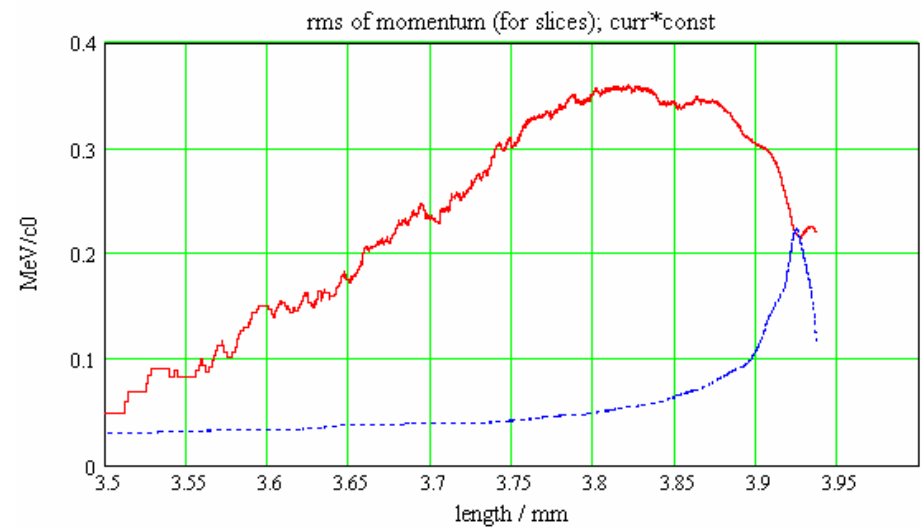
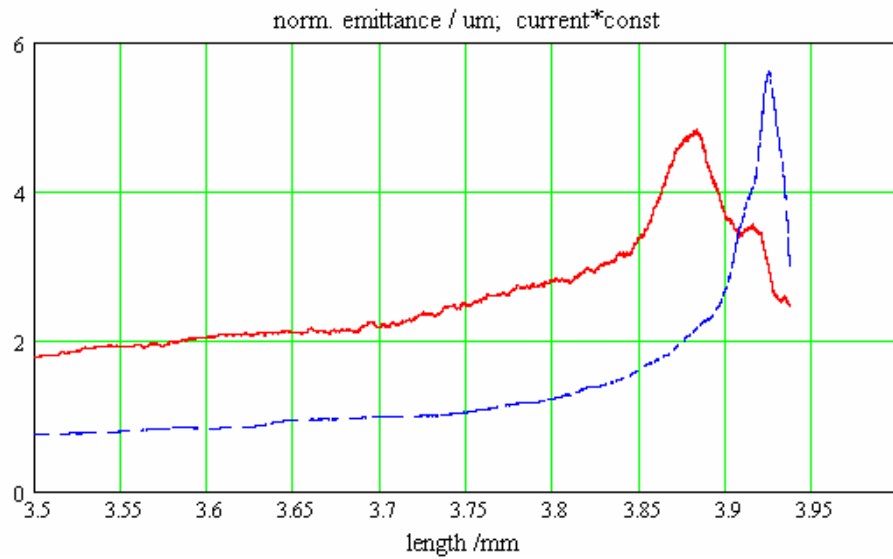
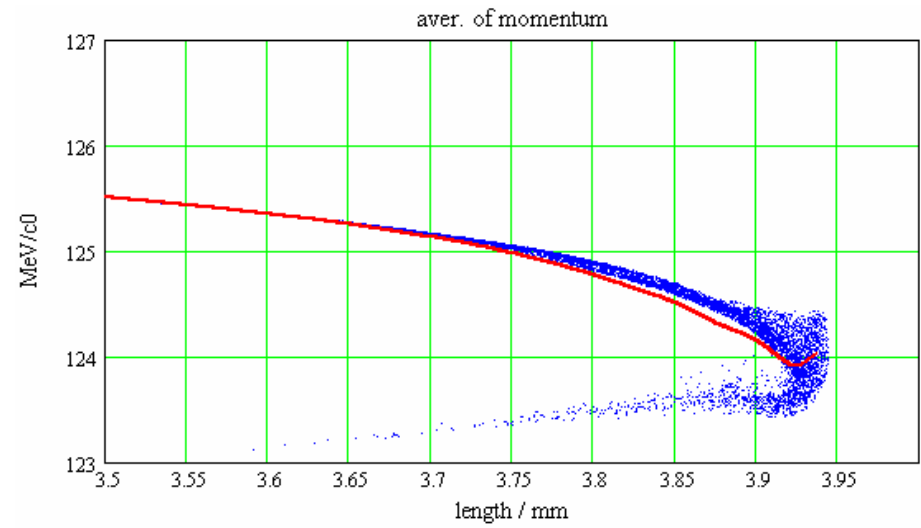
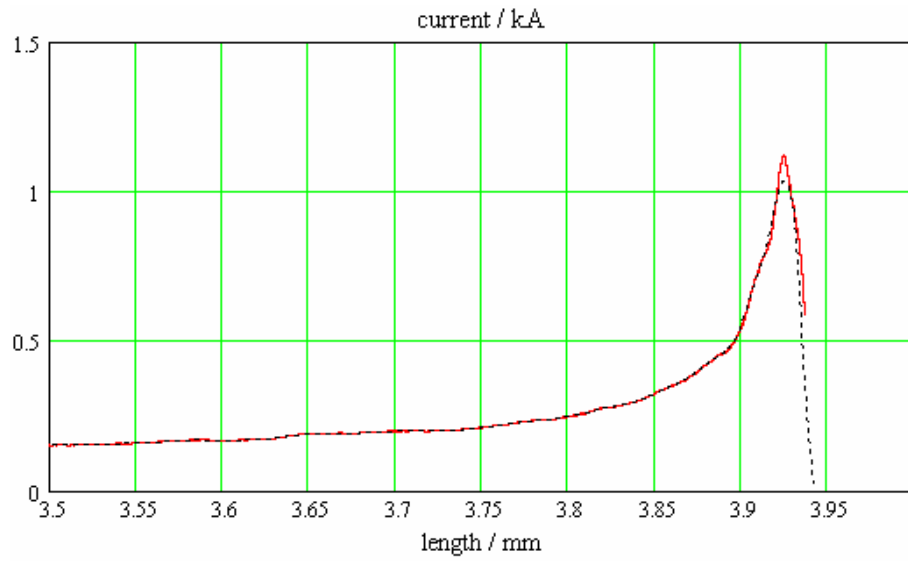
Slide Sorter Default Design

9 deg case:

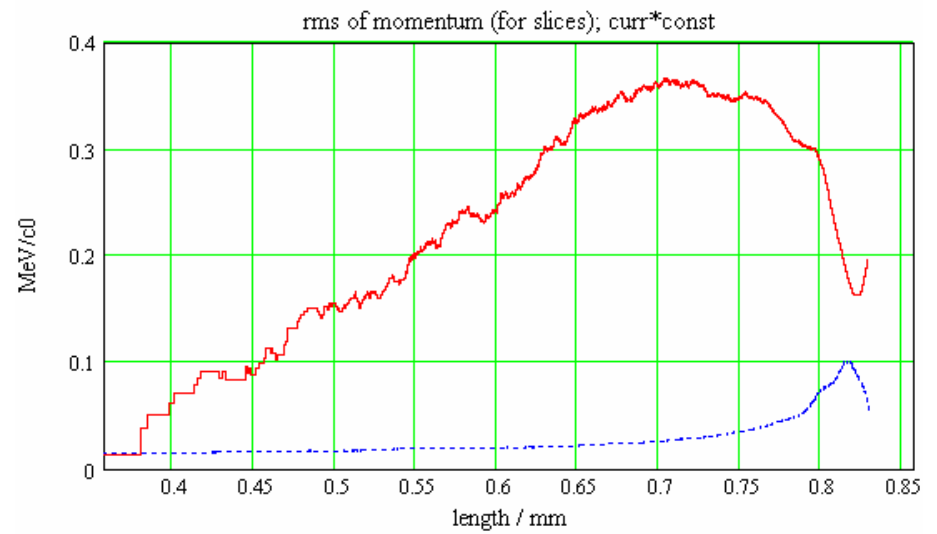
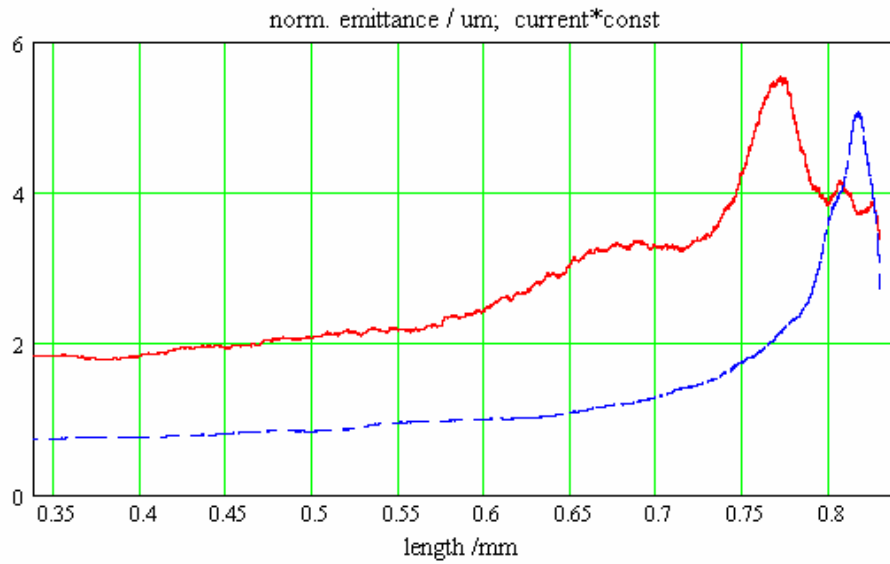
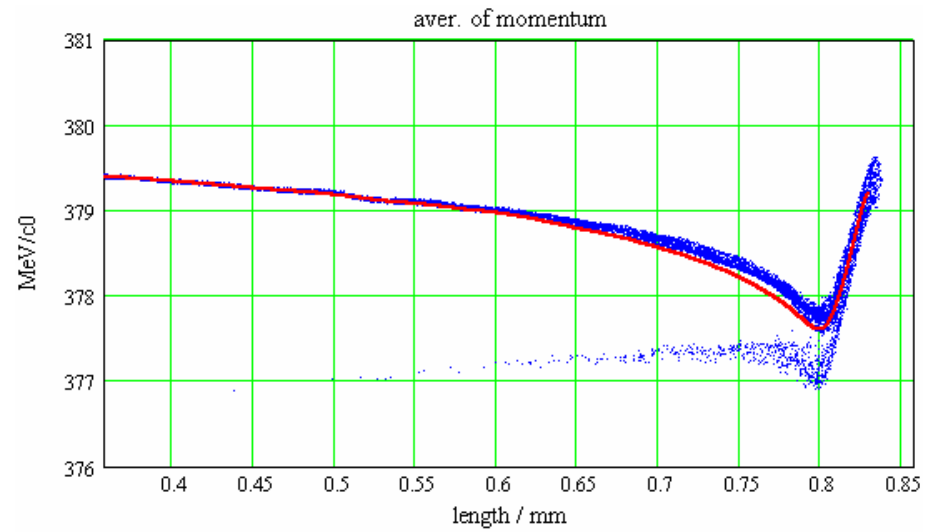
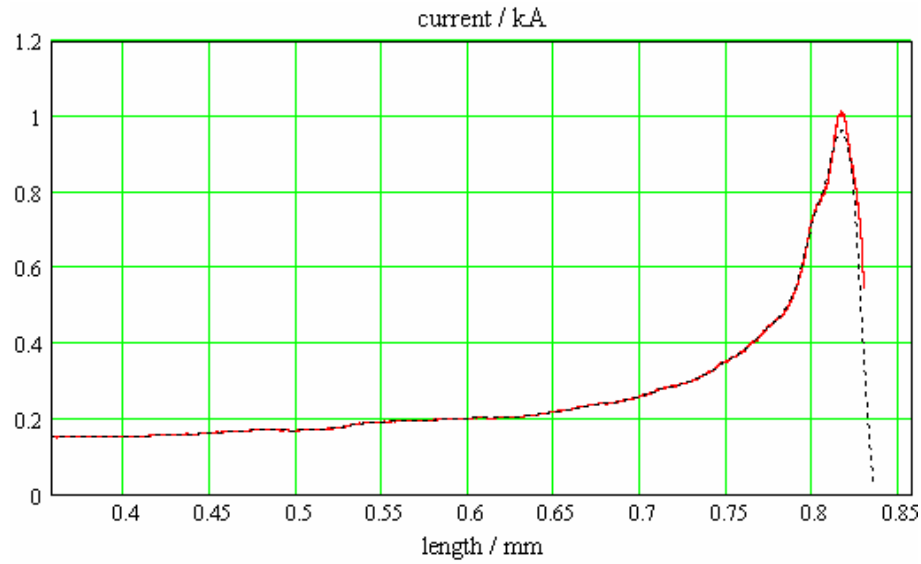
9 deg, before 1st BC



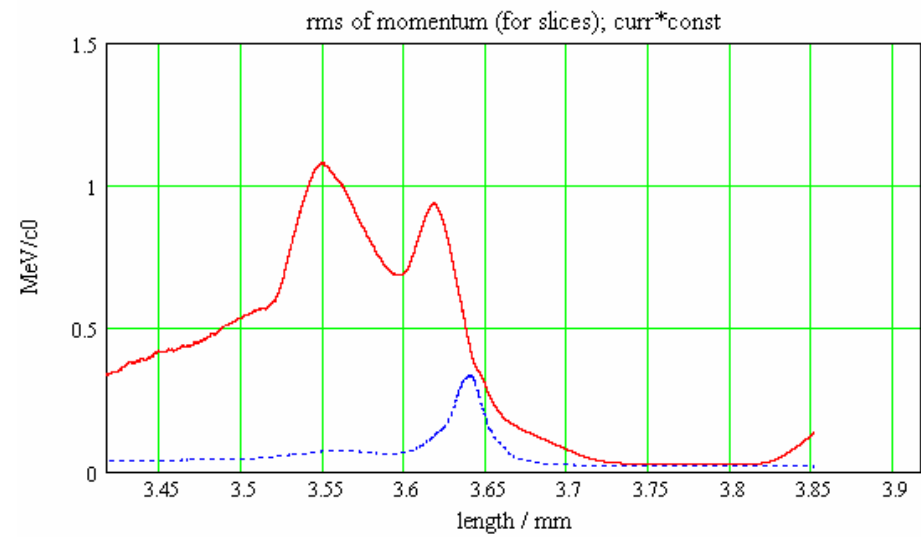
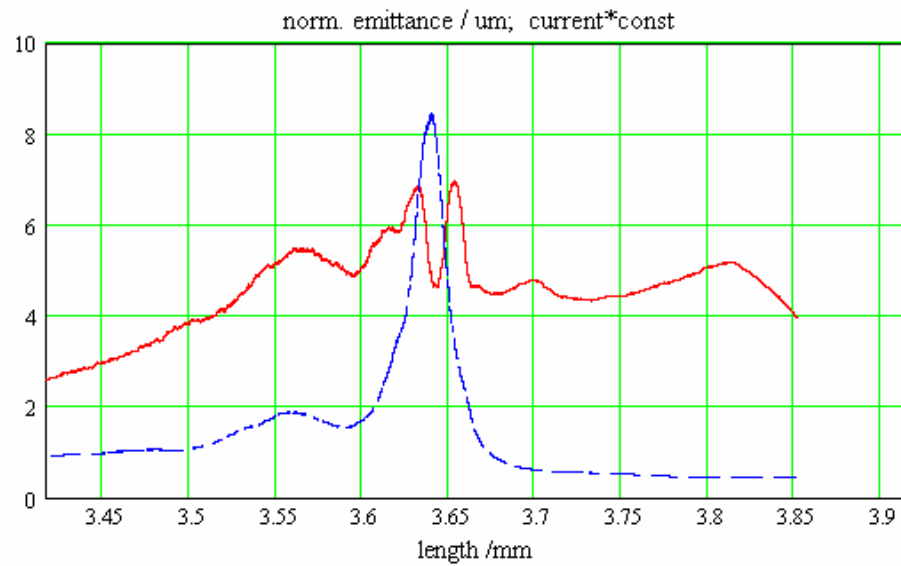
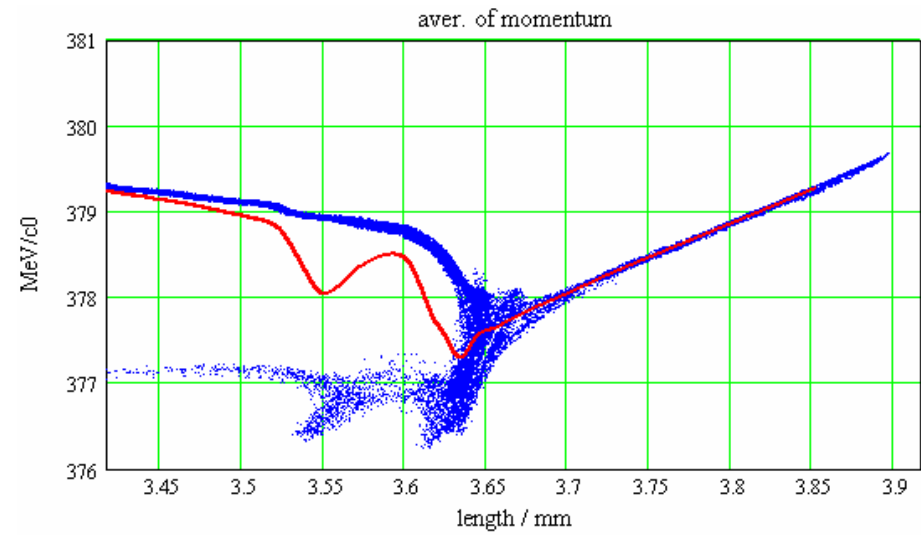
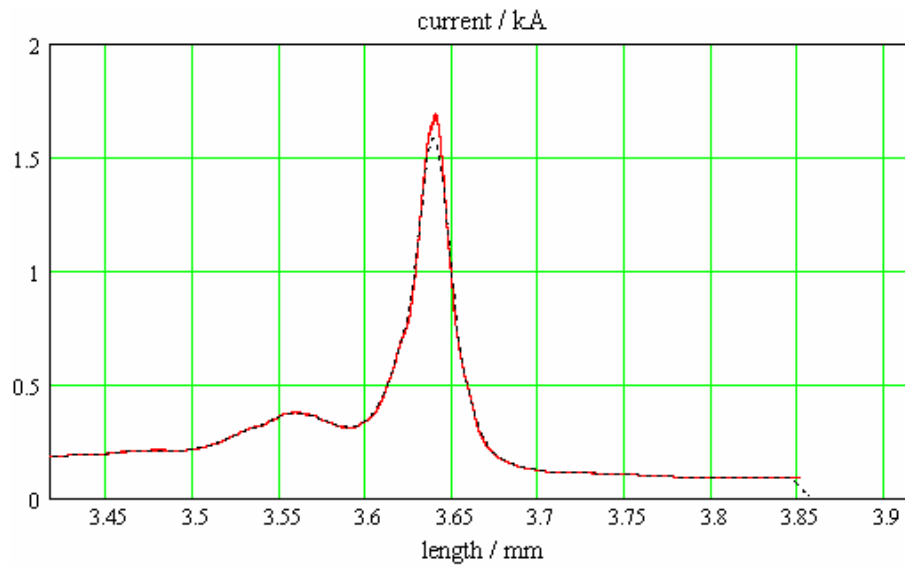
9 deg, after 1st BC



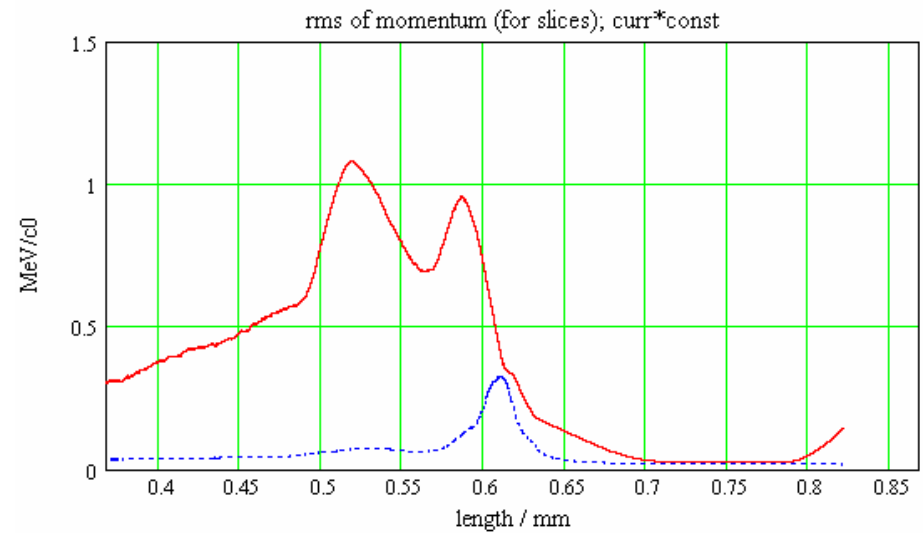
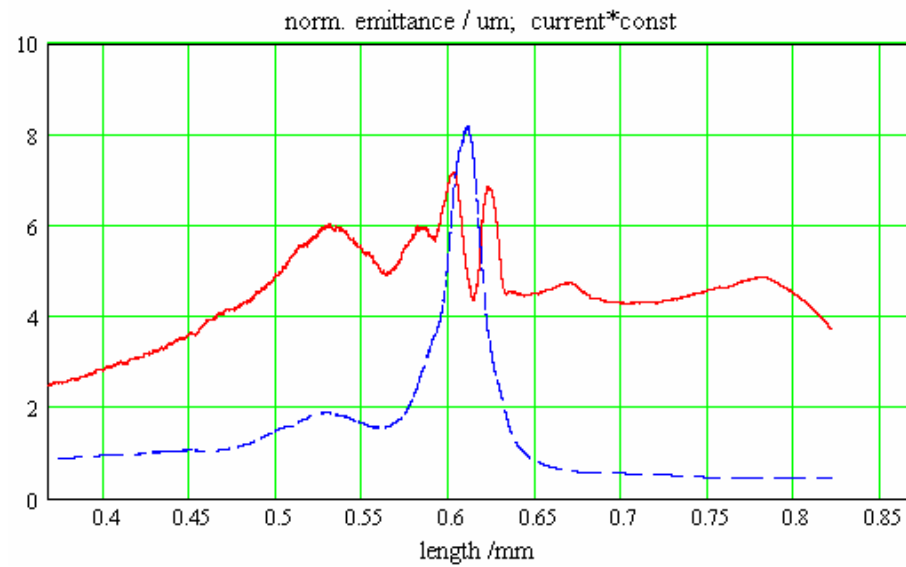
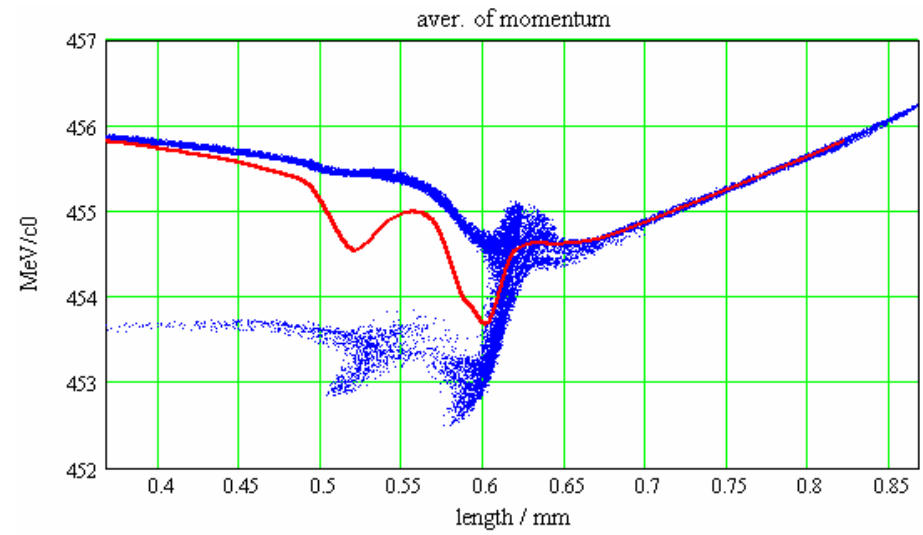
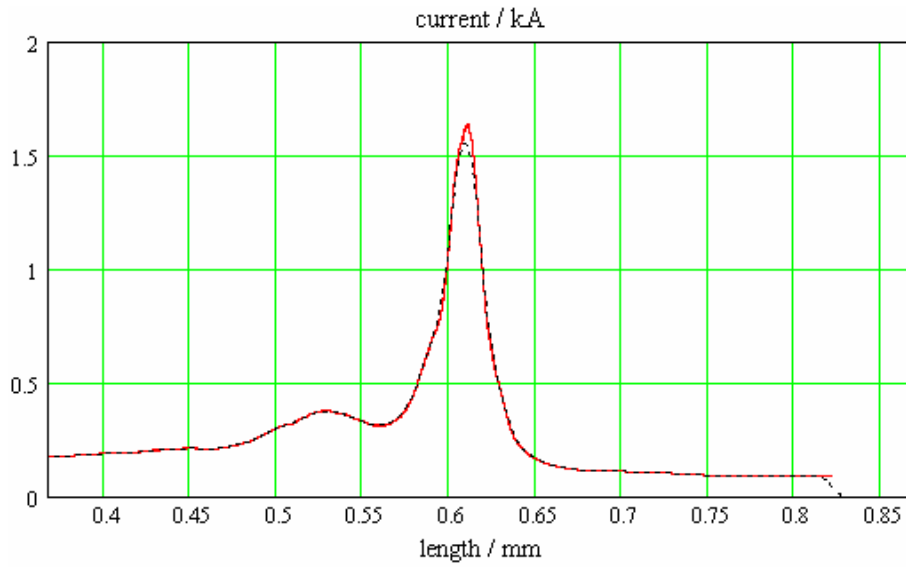
9 deg, before last BC



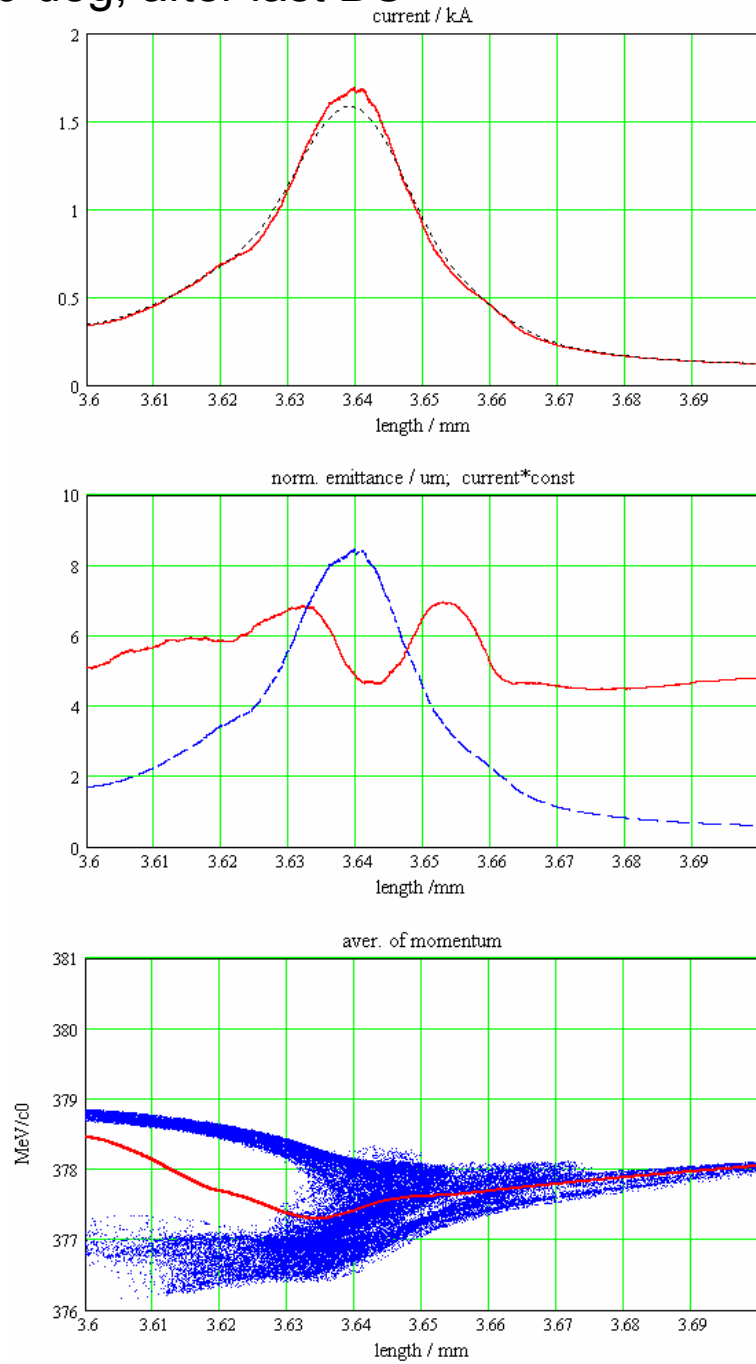
9 deg, after last BC



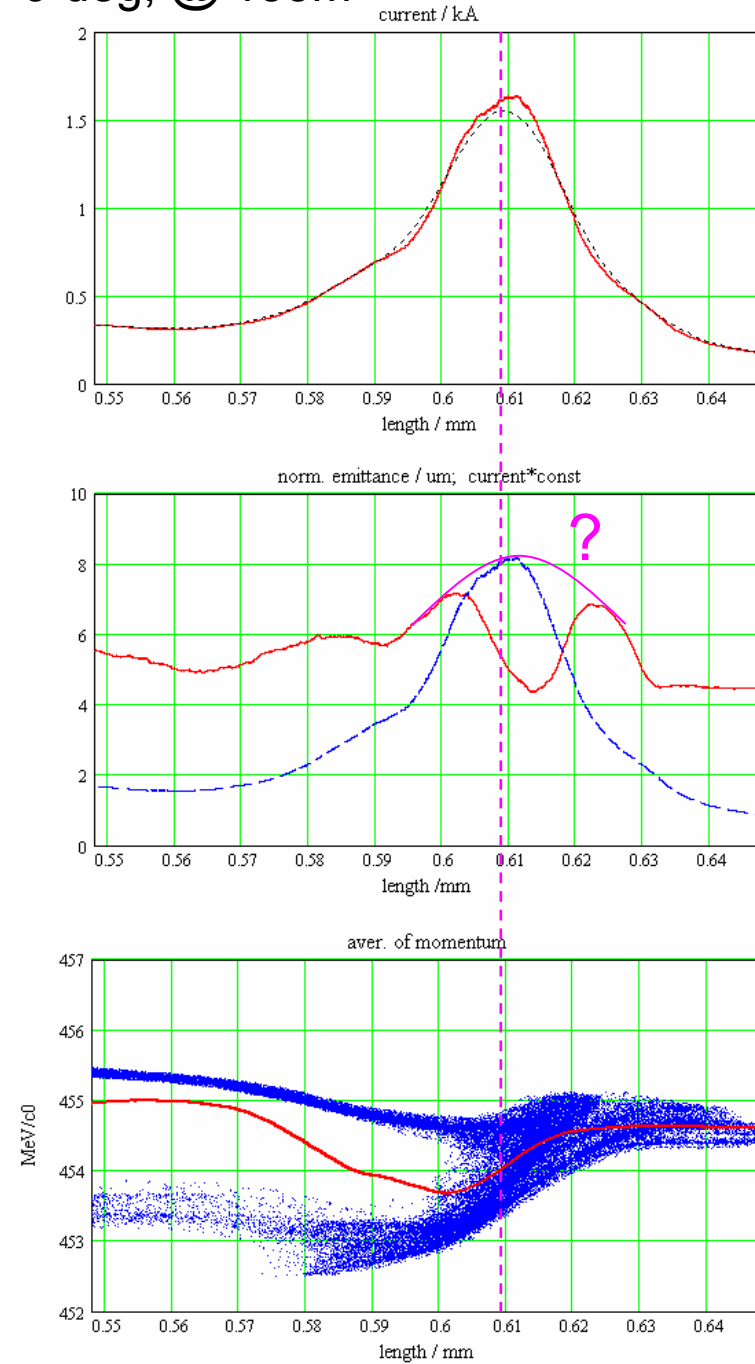
9 deg, @ 155m



9 deg, after last BC



9 deg, @ 155m

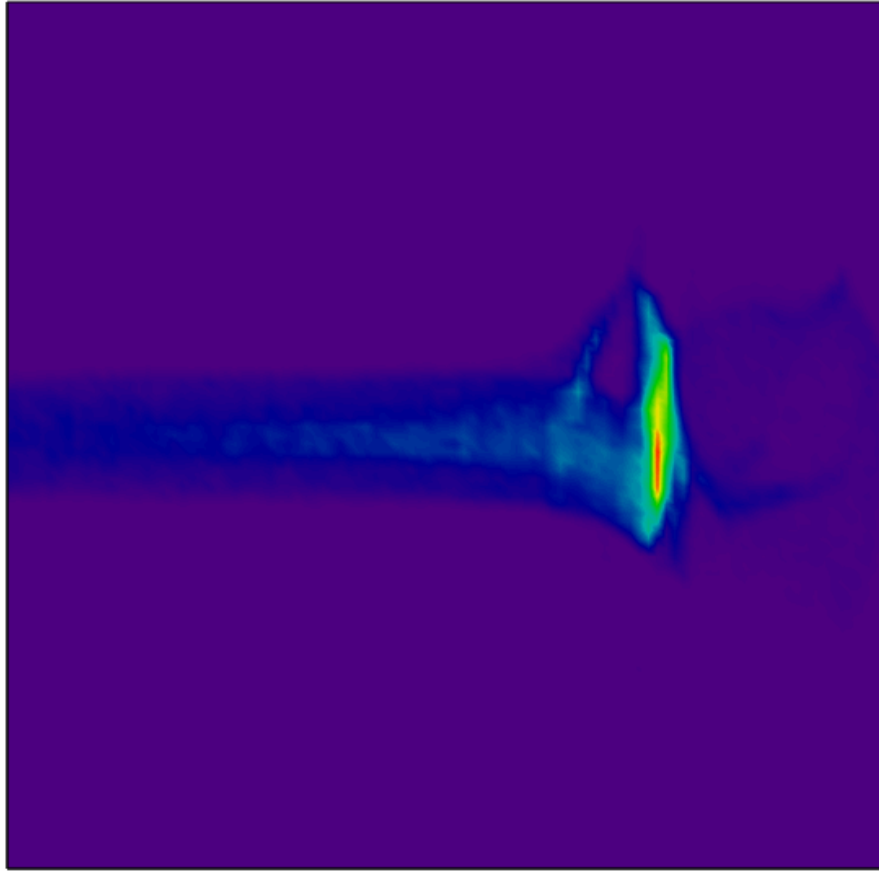


9 deg, @ 155m, x' vs. z

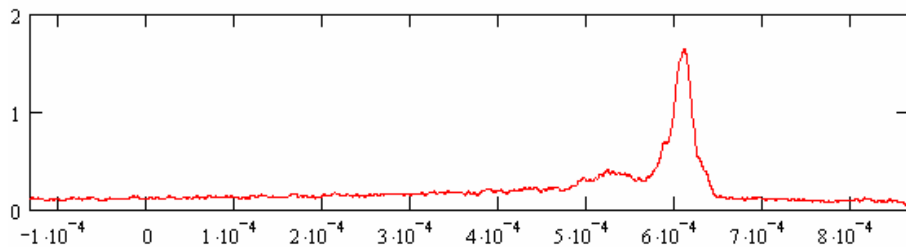
name = "../astra_bc_to_col/dat/y_9deg.out"

comment = "at 155m"

$x2o = 2 \times 10^{-3}$



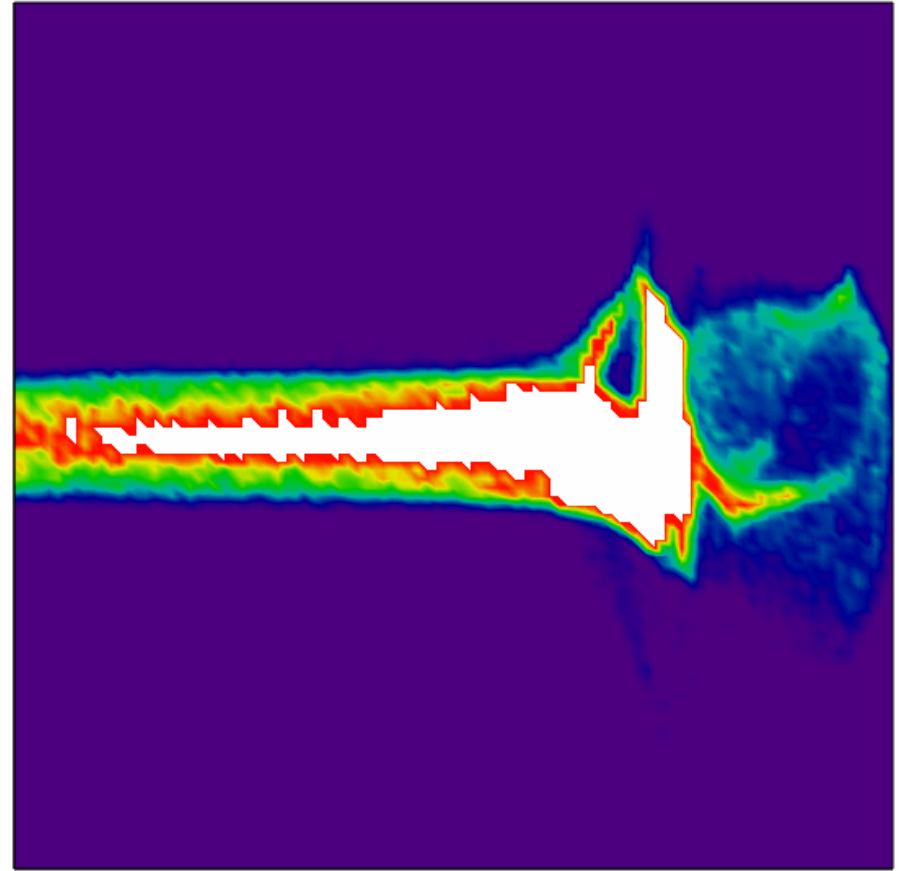
$x1o = -2 \times 10^{-3}$



name = "../astra_bc_to_col/dat/y_9deg.out"

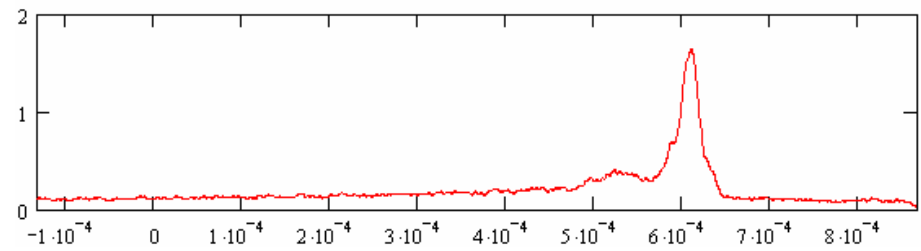
comment = "at 155m"

$x2o = 2 \times 10^{-3}$

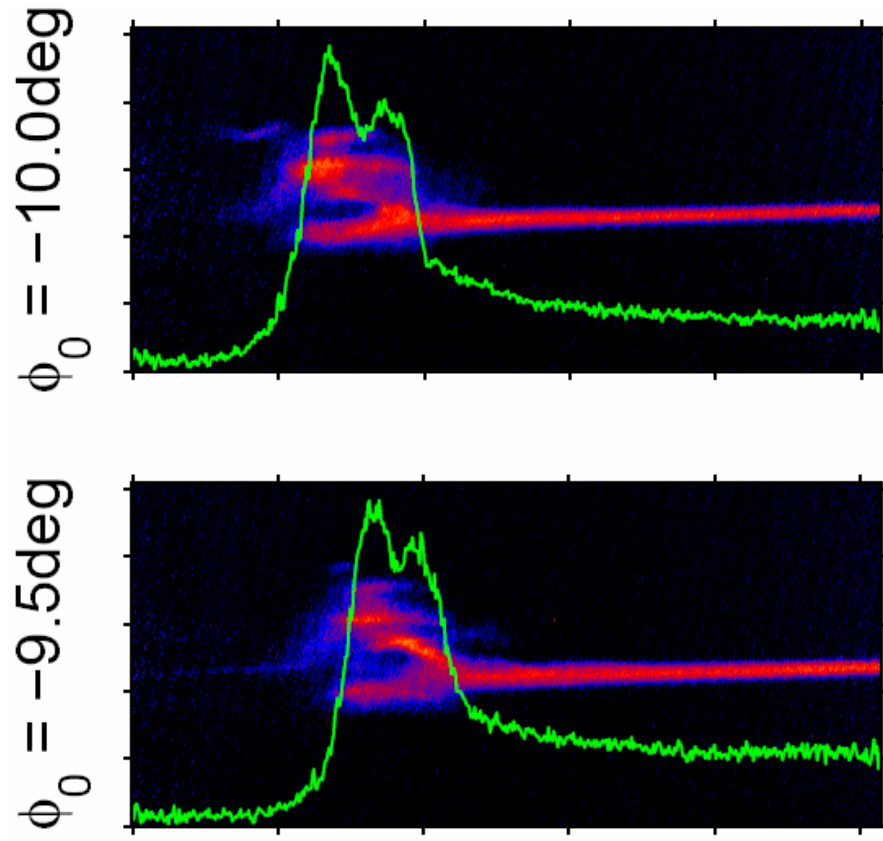
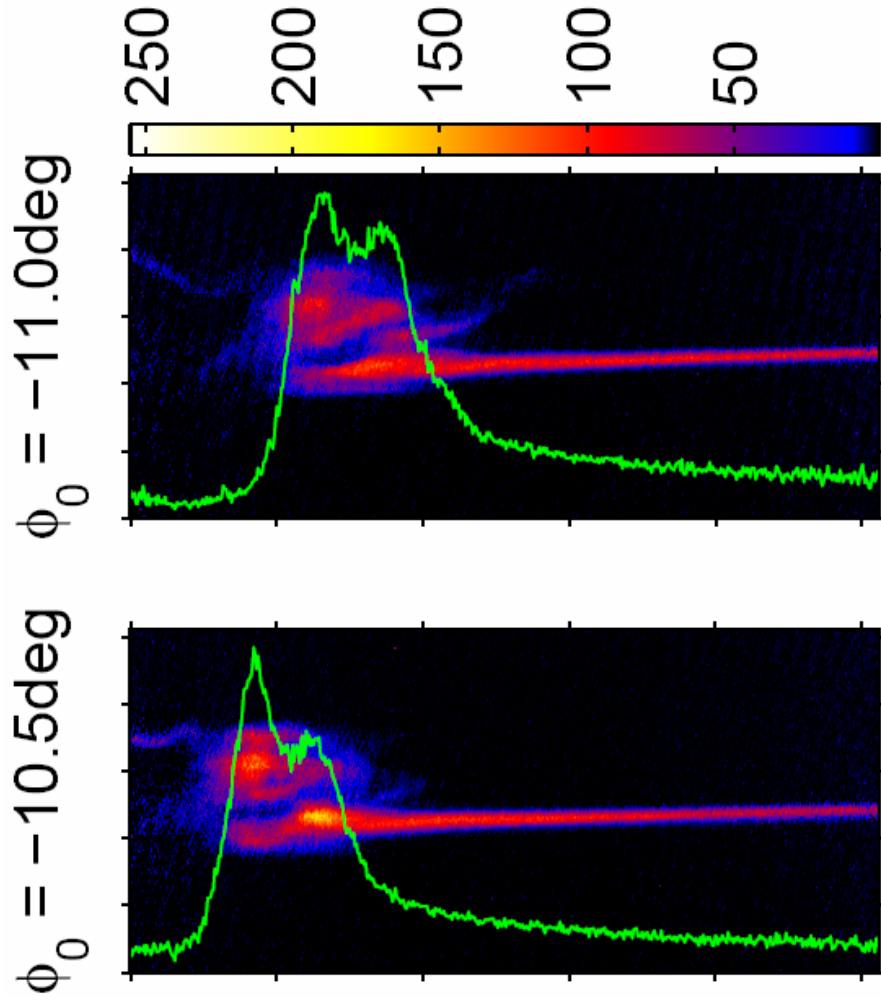


S2

$x1o = -2 \times 10^{-3}$



& LOLA

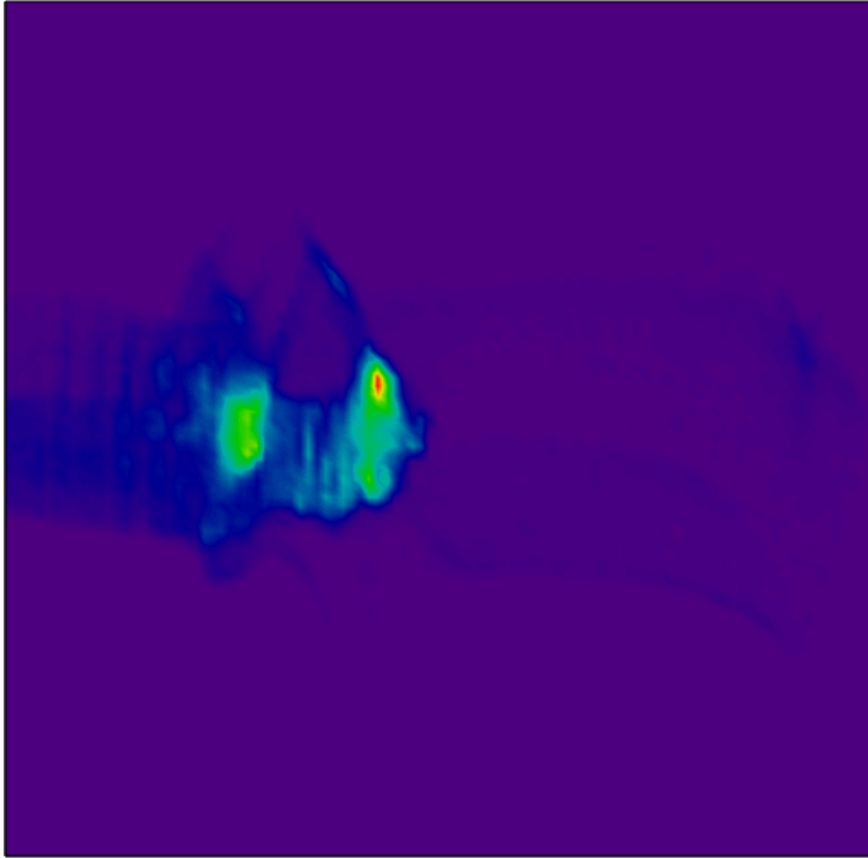


12 deg, @ 155m, x' vs. z

name = "../astra_bc_to_col/dat/y_12deg.out"

comment = "at 155m"

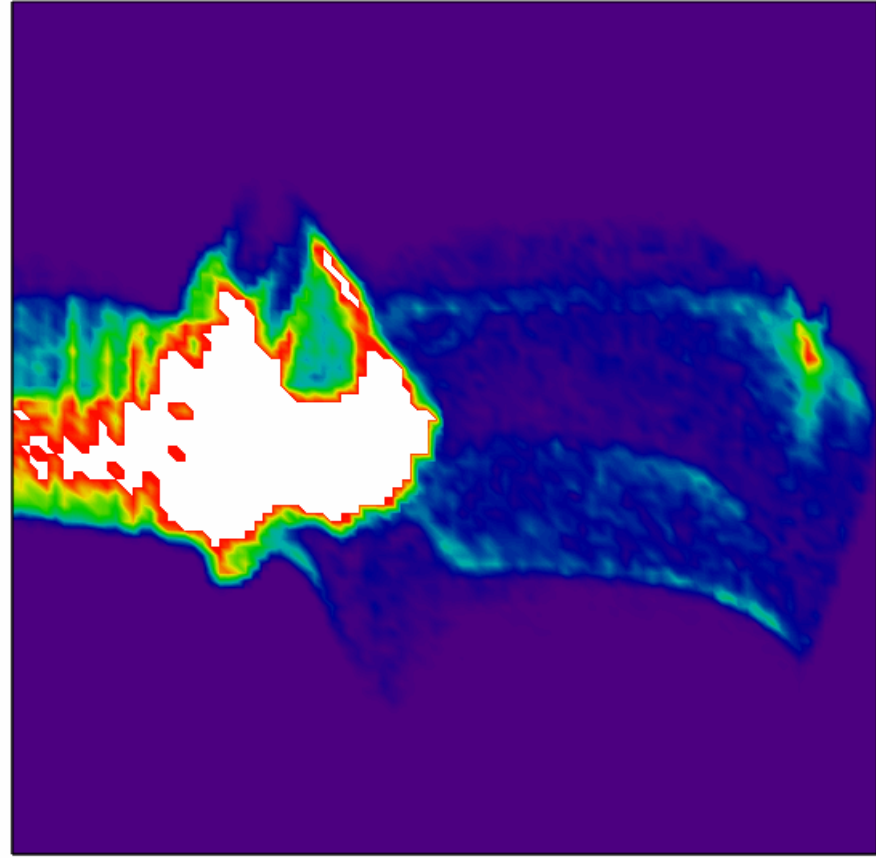
$x2_0 = 2 \times 10^{-3}$



name = "../astra_bc_to_col/dat/y_12deg.out"

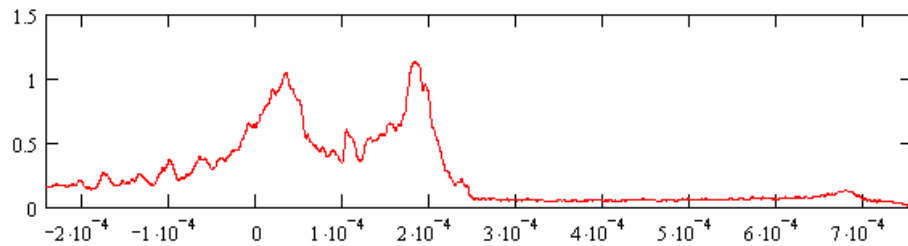
comment = "at 155m"

$x2_0 = 2 \times 10^{-3}$



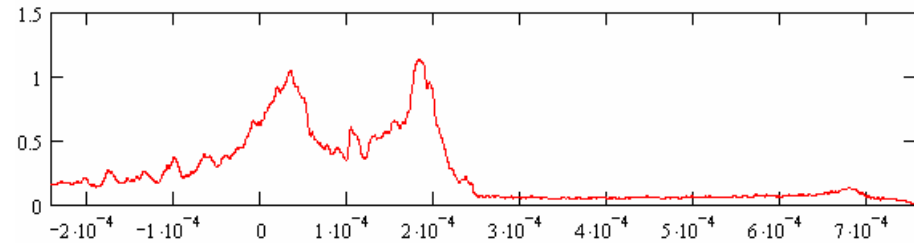
S2

$x1_0 = -2 \times 10^{-3}$



S2

$x1_0 = -2 \times 10^{-3}$



more: s2e_TTF2_06oc05_C.pdf

Microsoft PowerPoint - [s2e_TTF2_05oc05_C.ppt]

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Notes... Transition Design New Slide

after BC3
 $r56_{BC3} = 8\text{cm}$

1

2

3

4

5

6

7

8

9

Slide Sorter Default Design

to do & next

convergence tests: ASTRA mesh
particle number & filtering parameters

check MPI-ASTRA

automatisation of the procedure
(replace mcad sheets by fortran- or C-program)

“3D” CSRtrack calculation