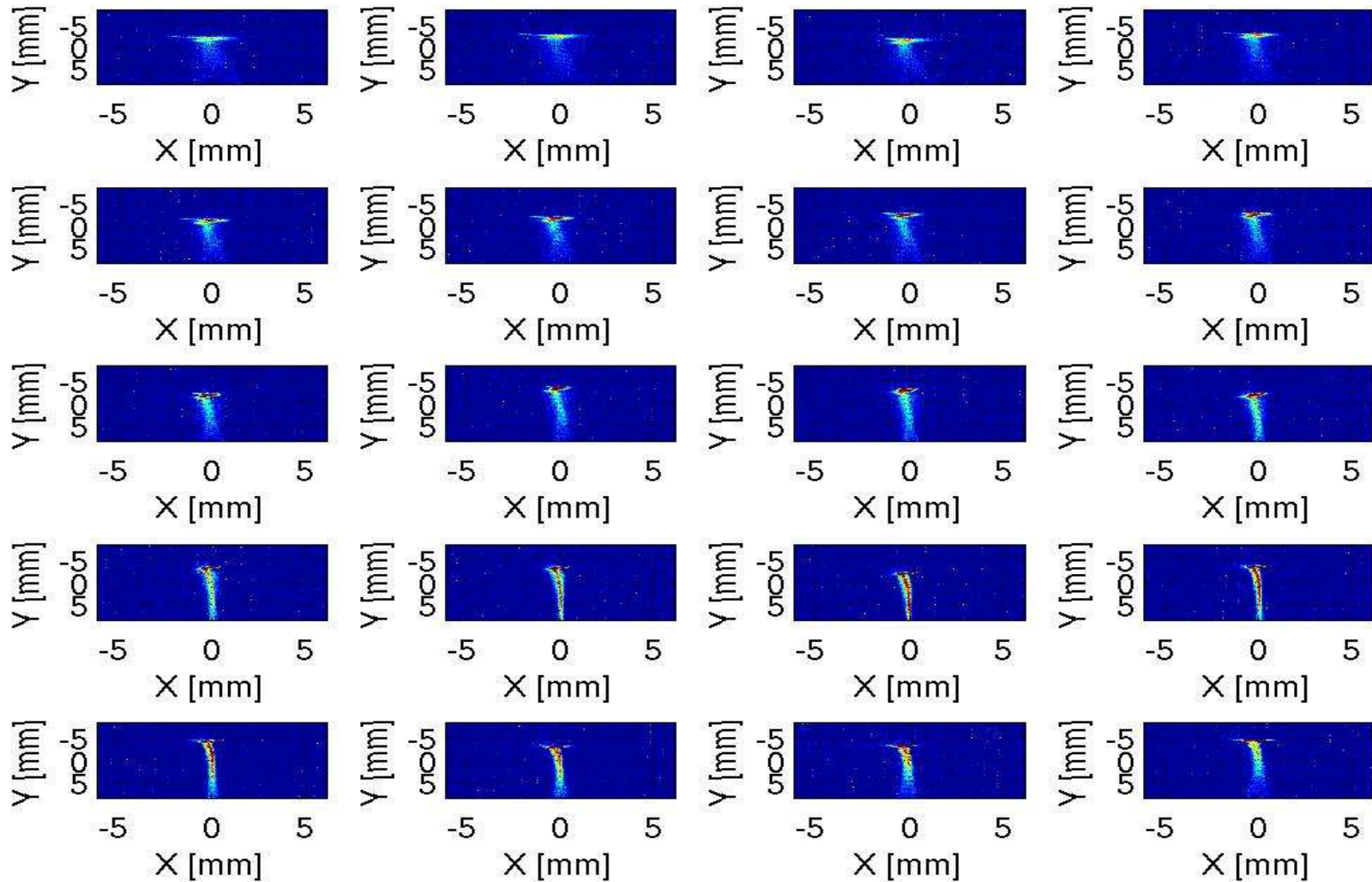


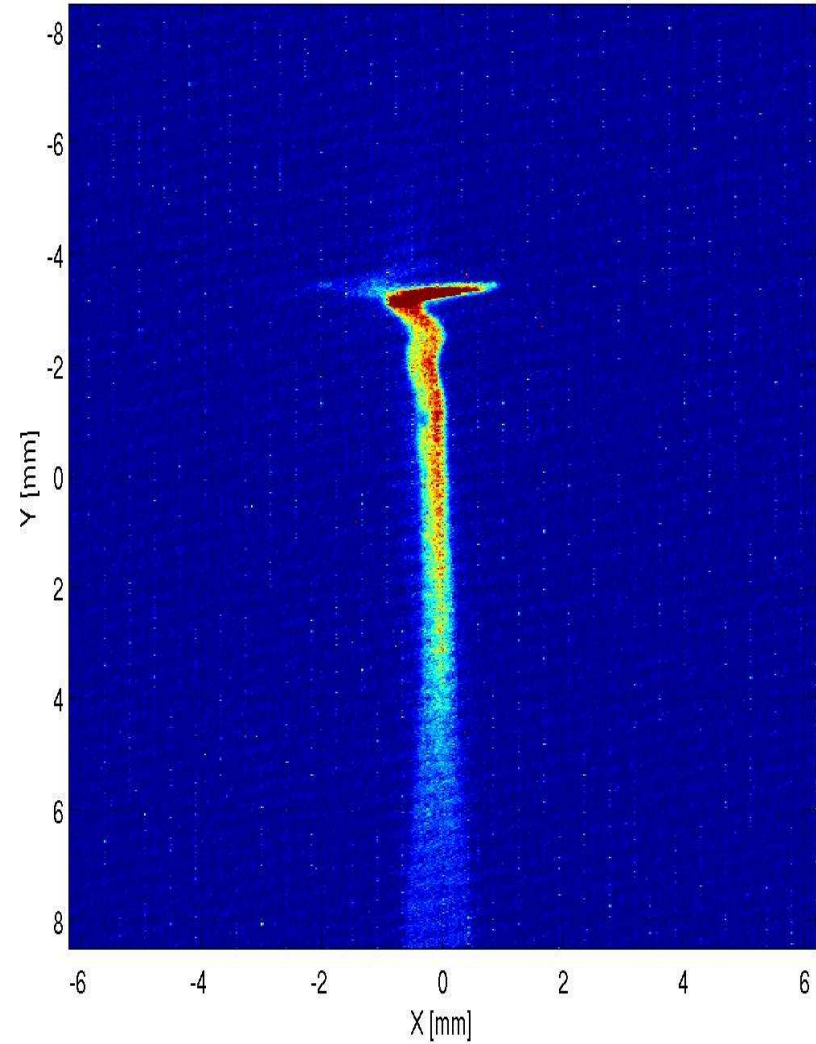
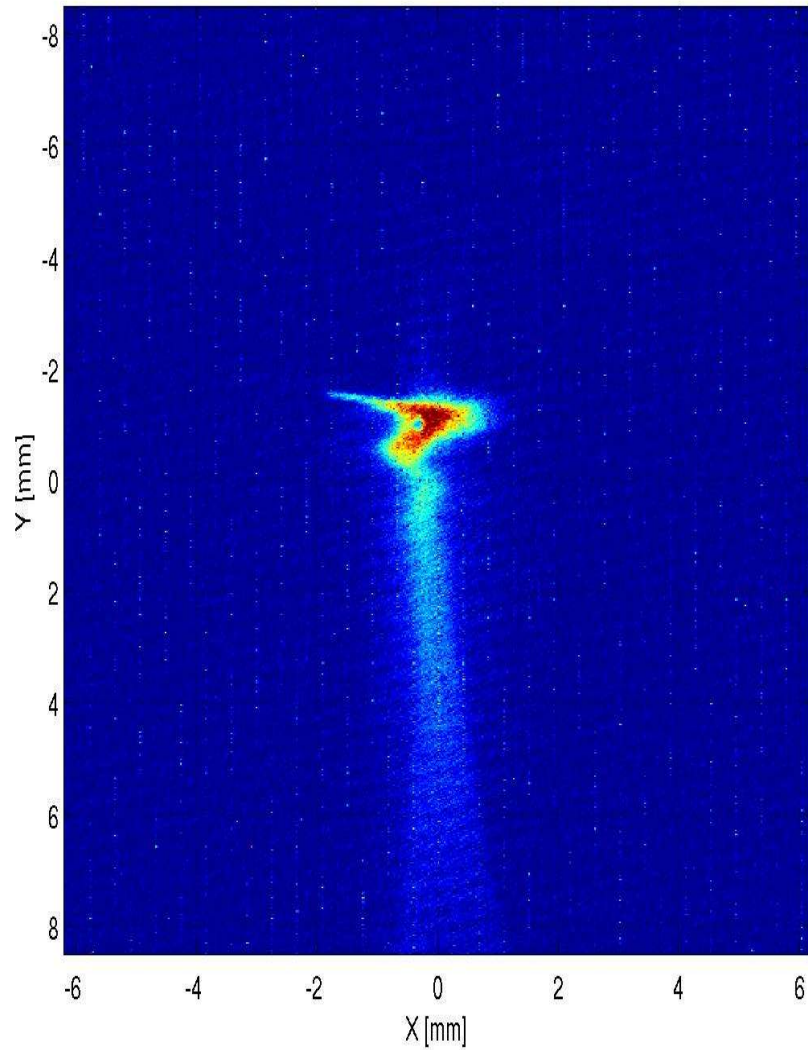
Horizontal Slice Emittance Measurements with Lola

Holger Schlarb, Markus Huening,
Michael Roehrs

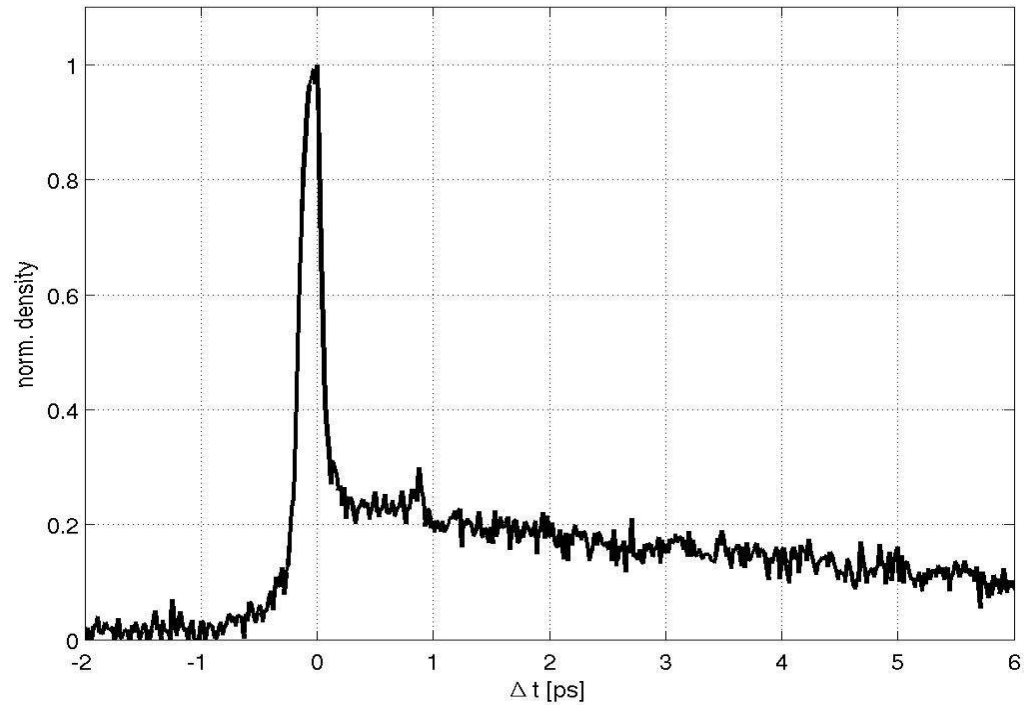
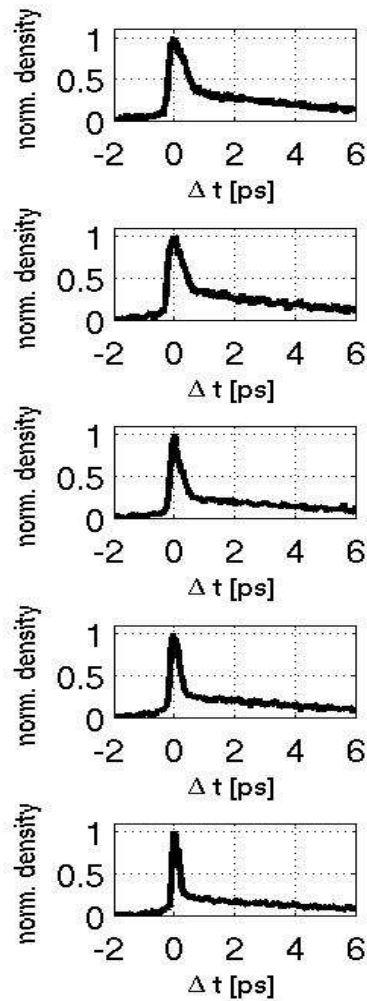
Vertically stretched bunches during quadrupole scan



Vertically stretched bunches during quadrupole scan



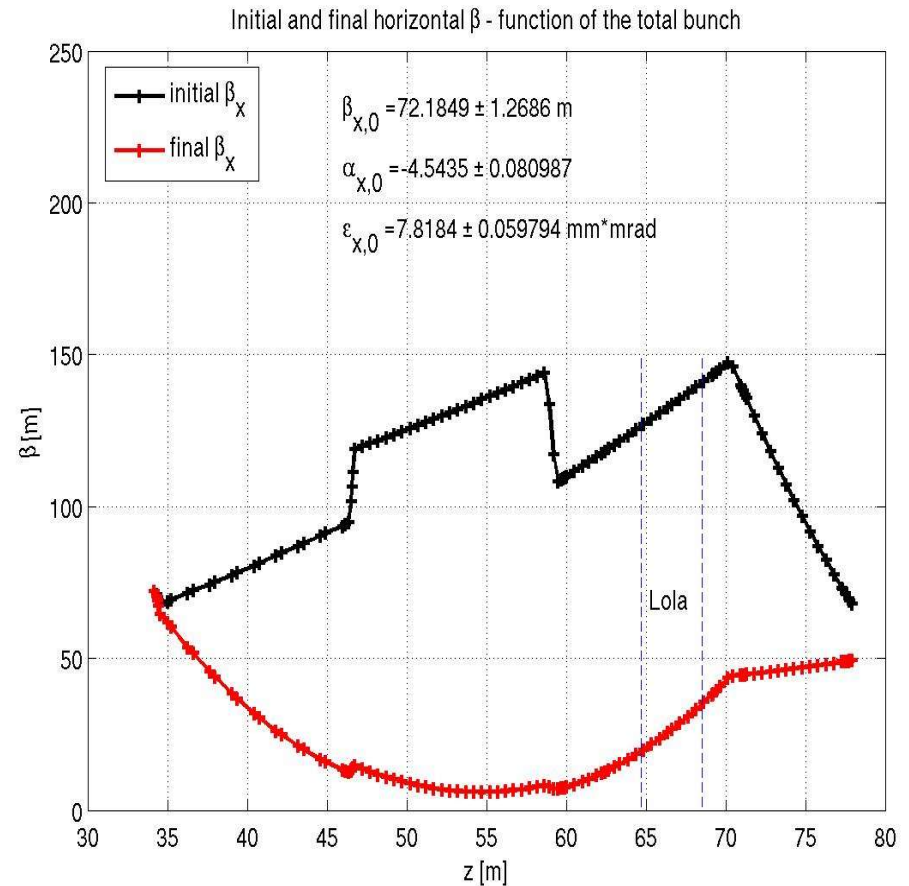
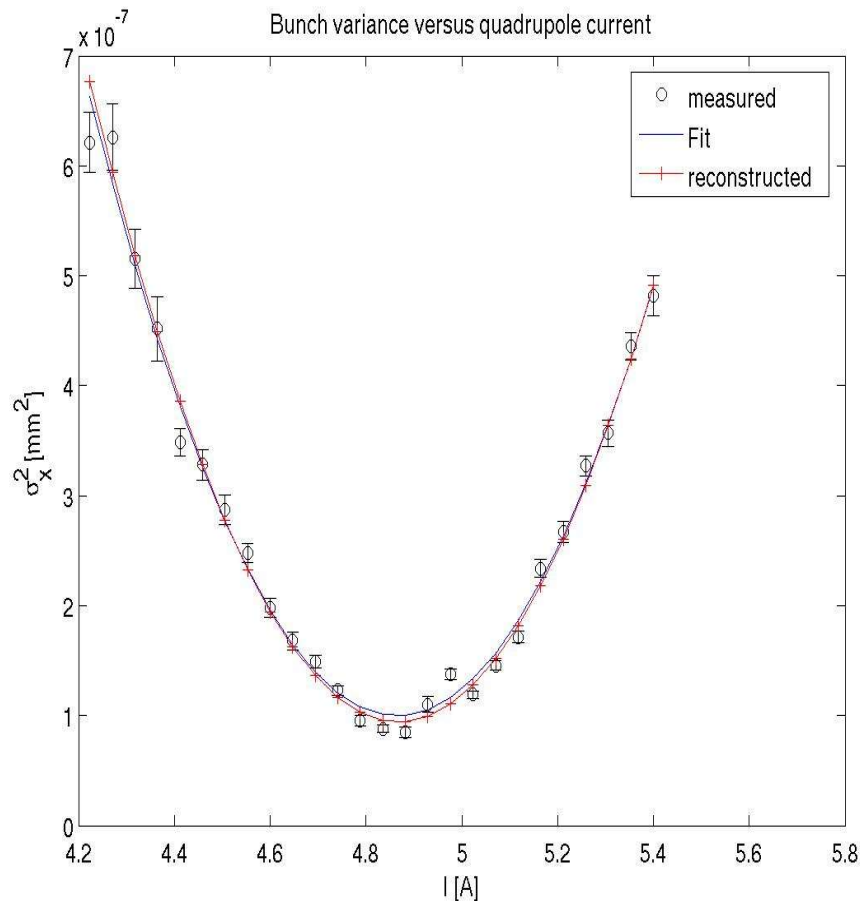
Longitudinal profiles



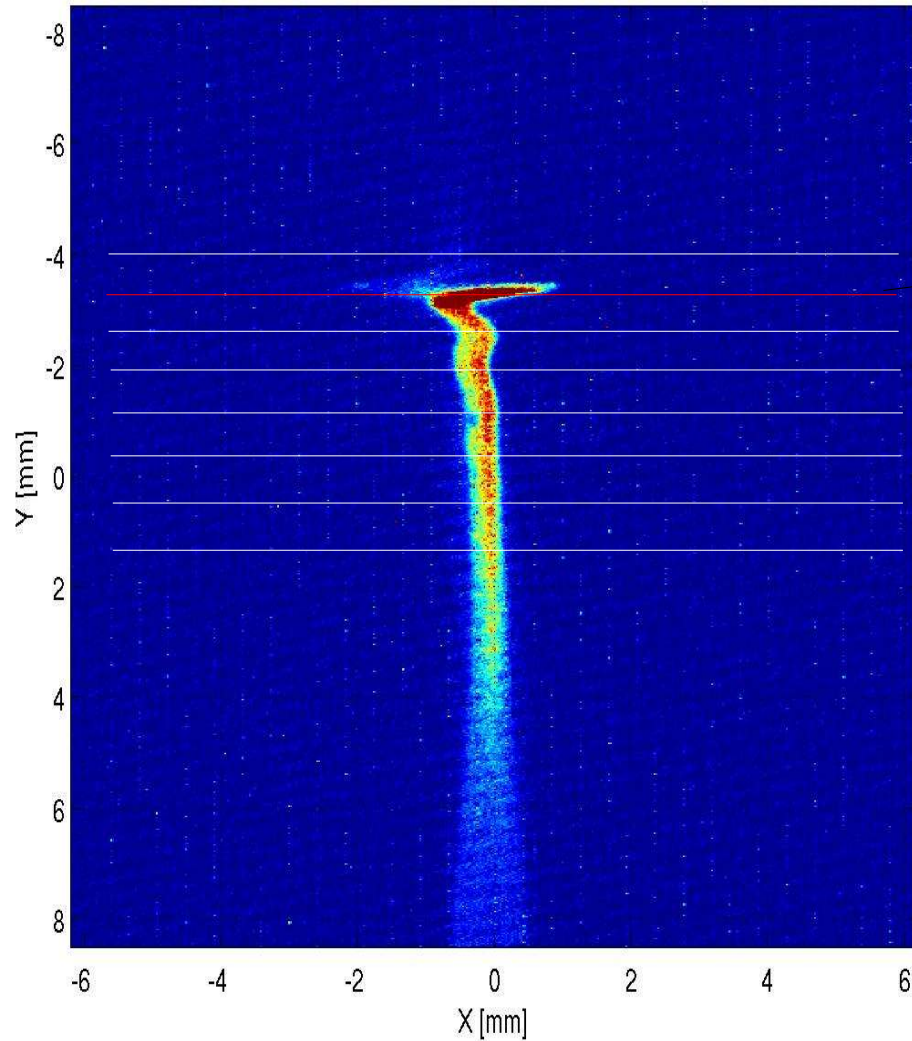
- Streak: 16.6 fs / pixel = 0.61 ps / mm

Bunch emittance (100%) and Twiss parameters

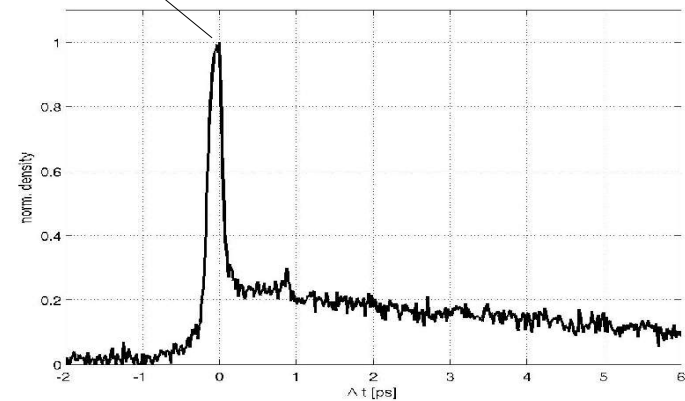
- 10 background and 10 beam images are used to determine the rms width for each quadrupole current
- only statistical errors are included



Subdivision into slices

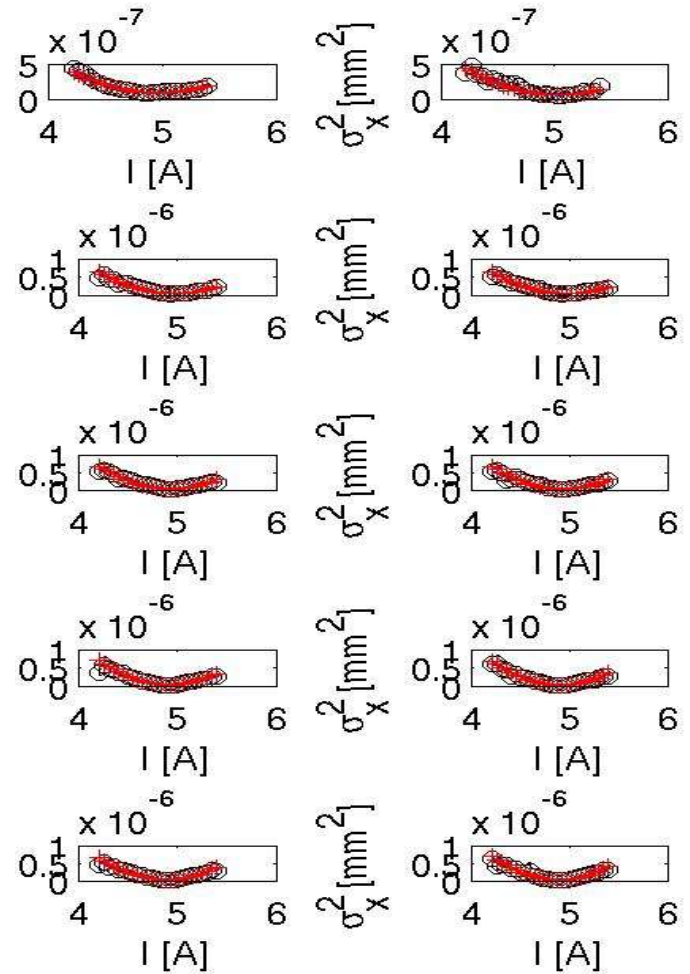
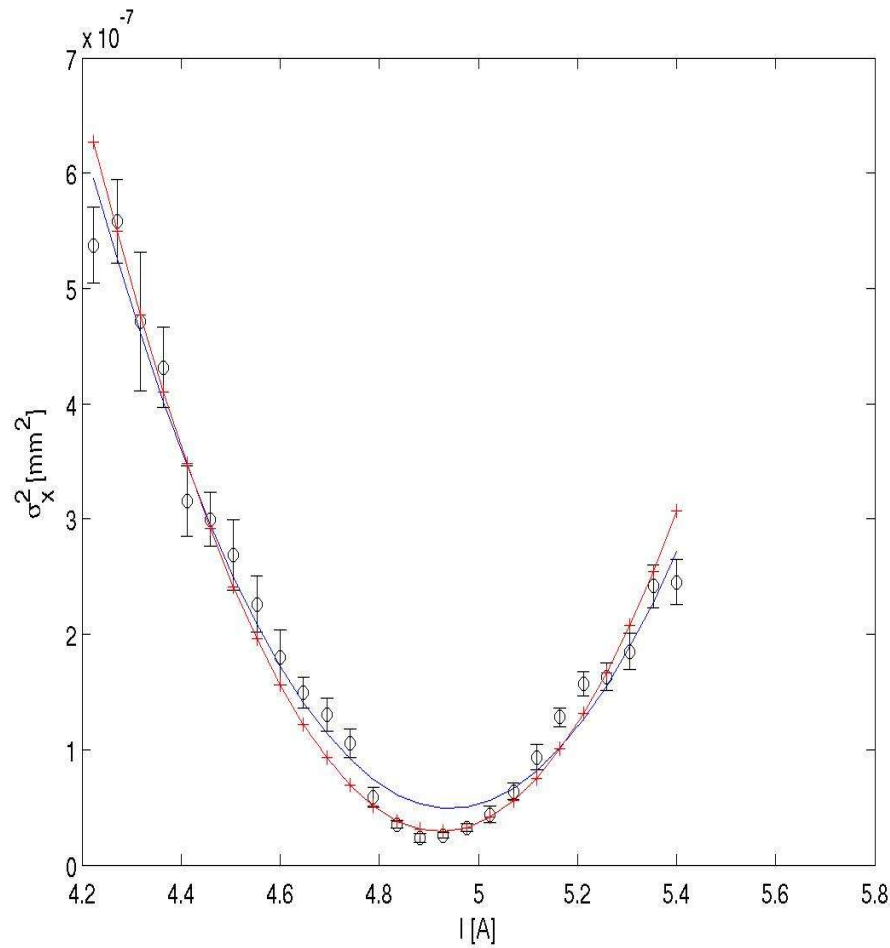


reference point:
peak in vertical
profile

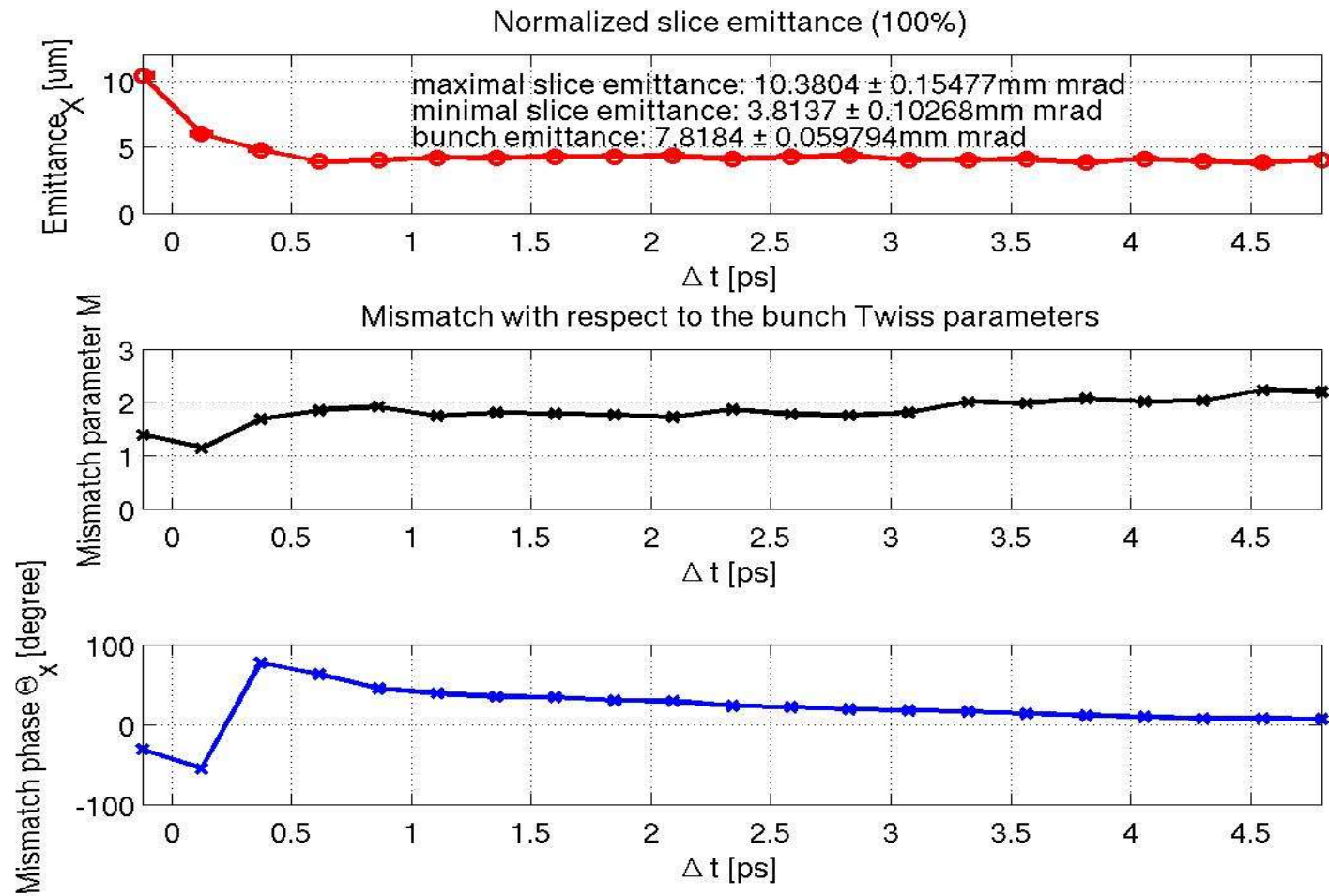


Slice width: 0.4 mm (y) ,
0.24 ps (z)

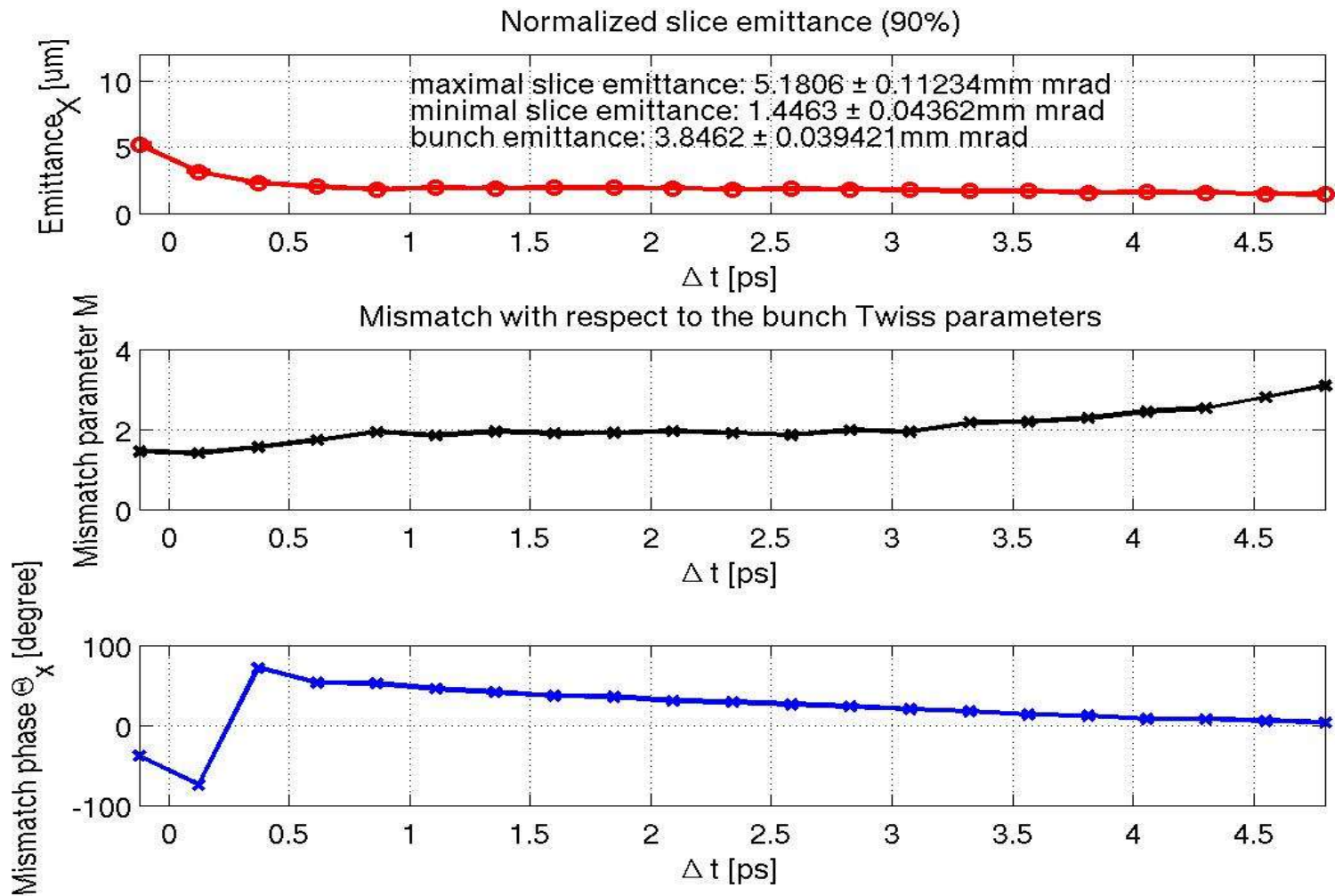
Horizontal slice widths



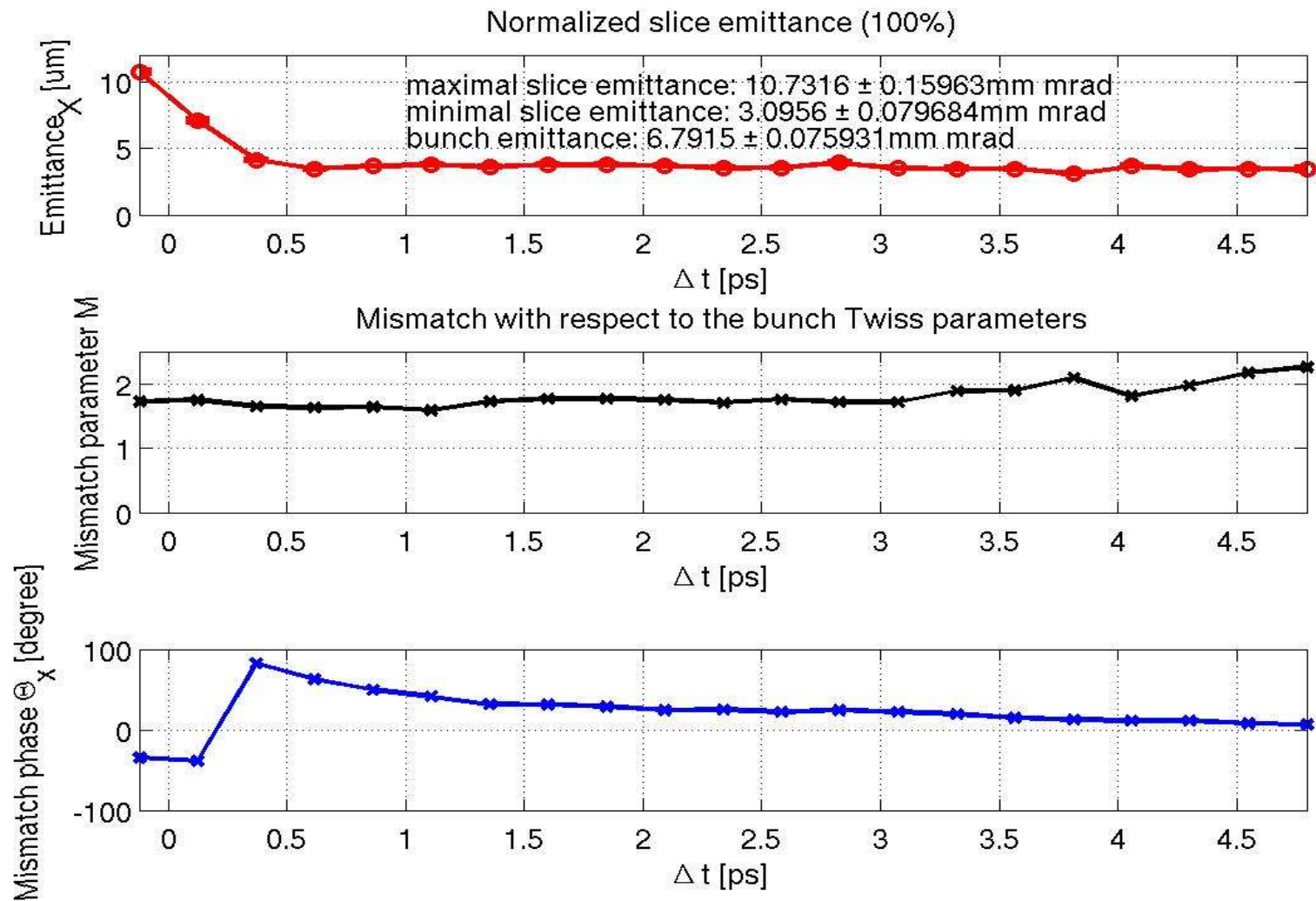
Horizontal slice emittance (100%) and mismatch



Horizontal slice emittance (90%) and mismatch



Horizontal slice emittance and mismatch (slightly different optics)



Possible Improvements of horizontal slice emittance measurements

- Measurement with fixed vertical beta function at the screen
- Reconstruction of the particle distribution in the (y,z)-plane using tomography
 - calculation of the true horizontal slice widths?
 - determination of the longitudinal resolution