Emittance growth studies using static bumps in the ATF EXT line

Reproduce the simulation of the beam size at the OTR as a function of the bump amplitude

16th April 2008

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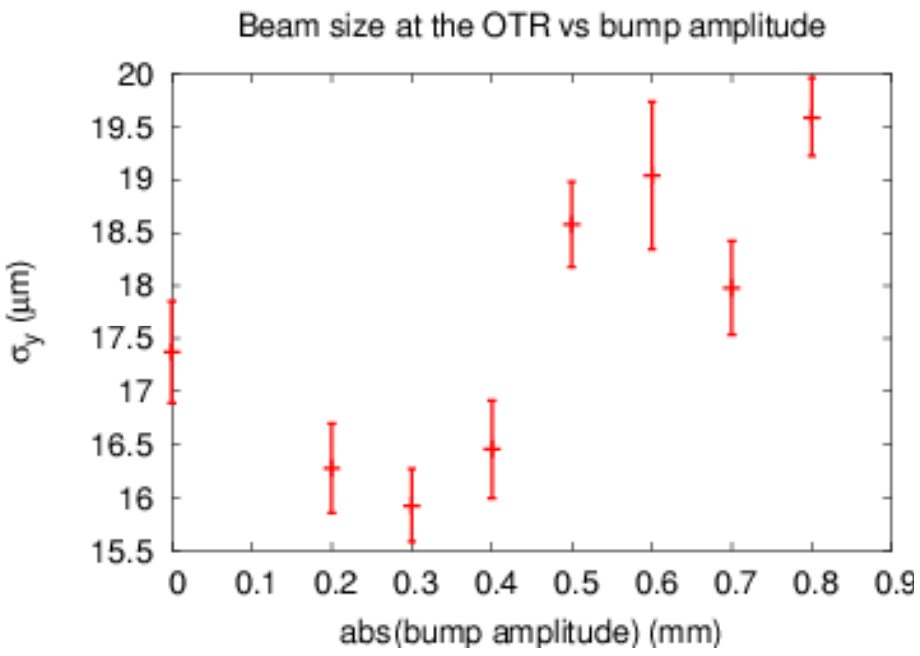
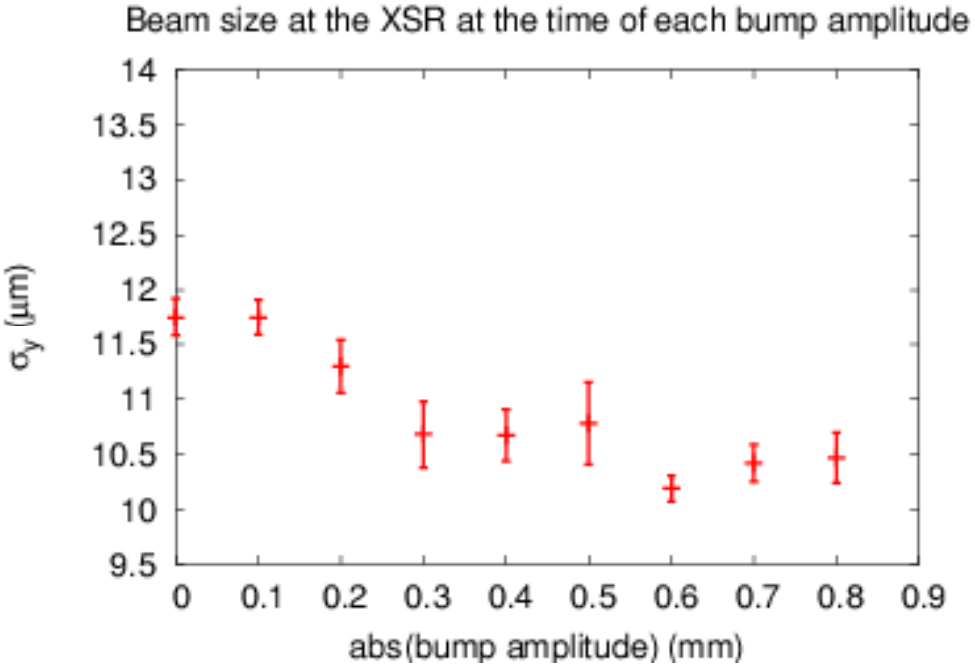
Parasitic measurements 19th December 2007

Extraction Line (OTR)



Damping Ring (XSR)



* Conversion factor channels-μm for OTR is not very precise

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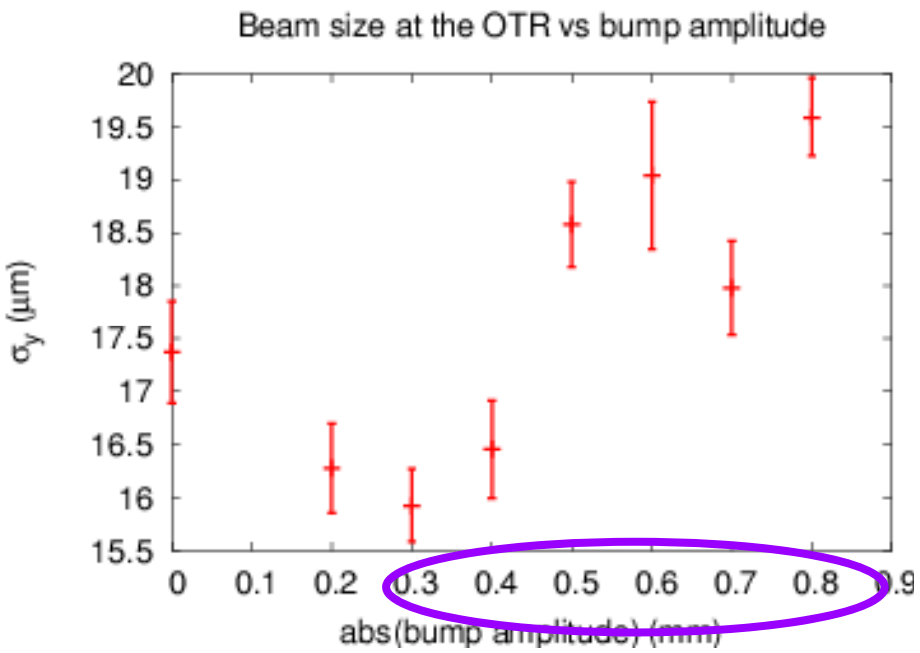
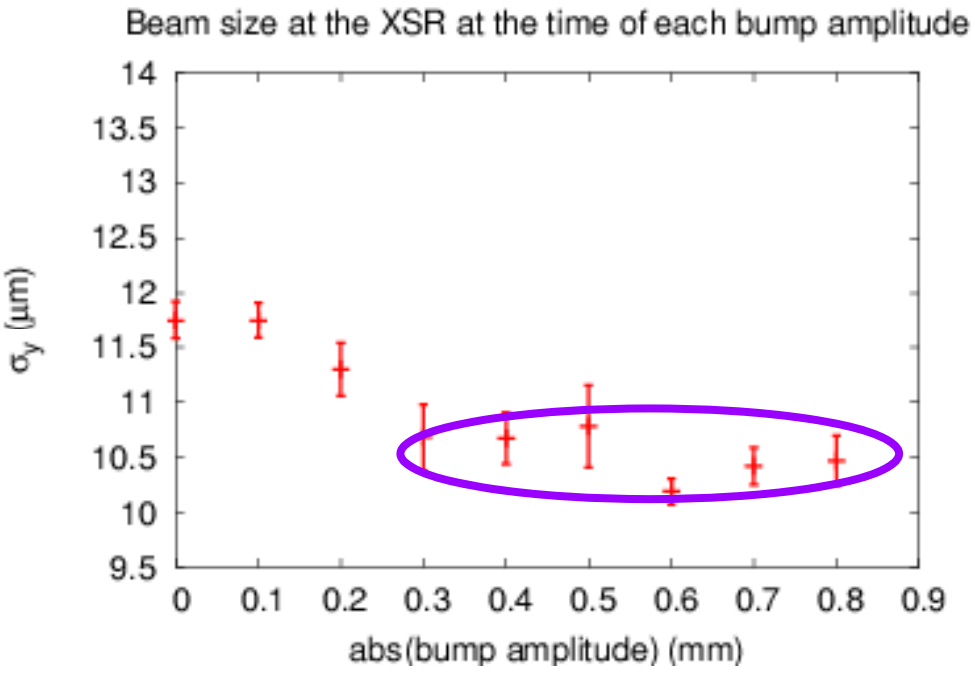
Parasitic measurements 19th December 2007

Extraction Line (OTR)



Damping Ring (XSR)



→ Assumption: 0.3 mm bump corresponds to the minimum emittance, minimum displacement in QM7 → let's consider from 0.3 to 0.8 mm bump (total range 0.5 mm)

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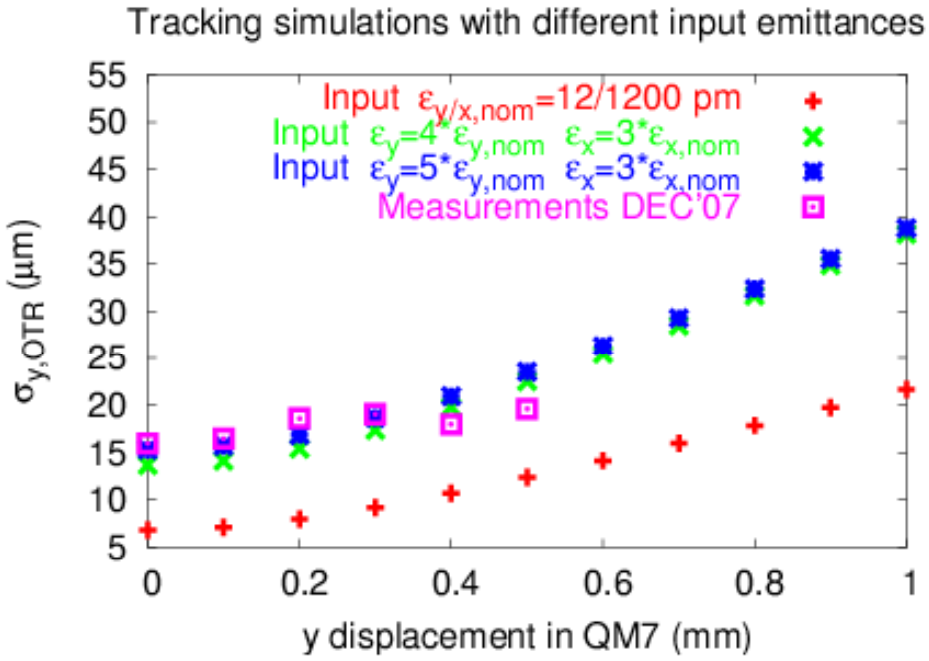
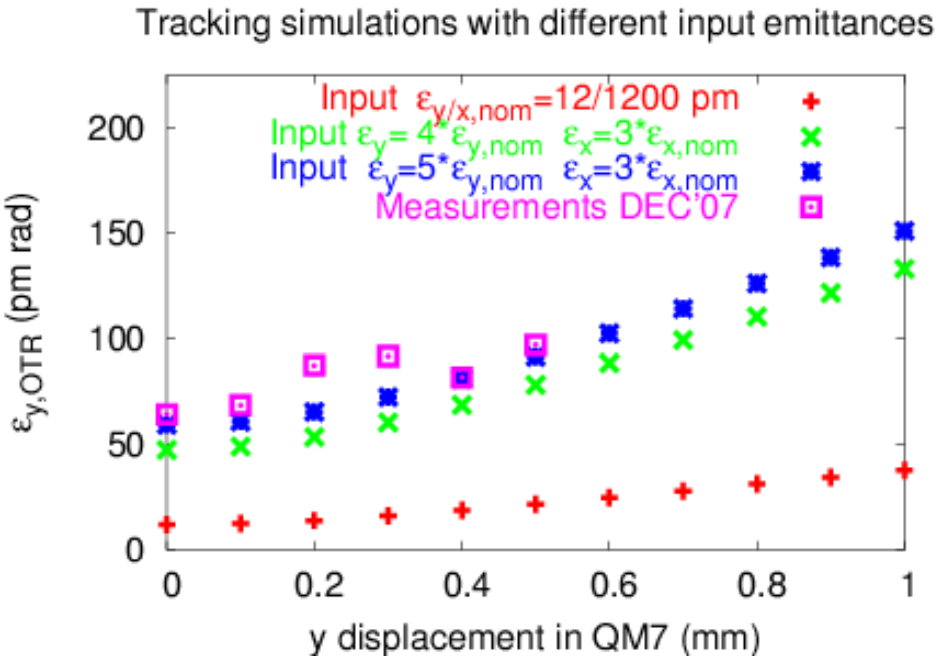
Tracking simulations in the Extraction Line

- With bumps created with ZV9R and ZV100R
- Including non-linearity in QM7
- For different input emittances

DR emittances during the shift computed from beam sizes and ß-functions at the XSR:

ε_y=51.48 pm ~ 4*$\varepsilon_{y,nom}$
ε_x=3.78 nm ~ 3* $\varepsilon_{x,nom}$





For the conversion to emittances of the measured beam sizes at the OTR, ß$_y$=3.96 m at the OTR location is considered.