Emittance growth studies using static bumps in the ATF EXT line

Reproduce the simulation of the OTR size as function of bump amplitude

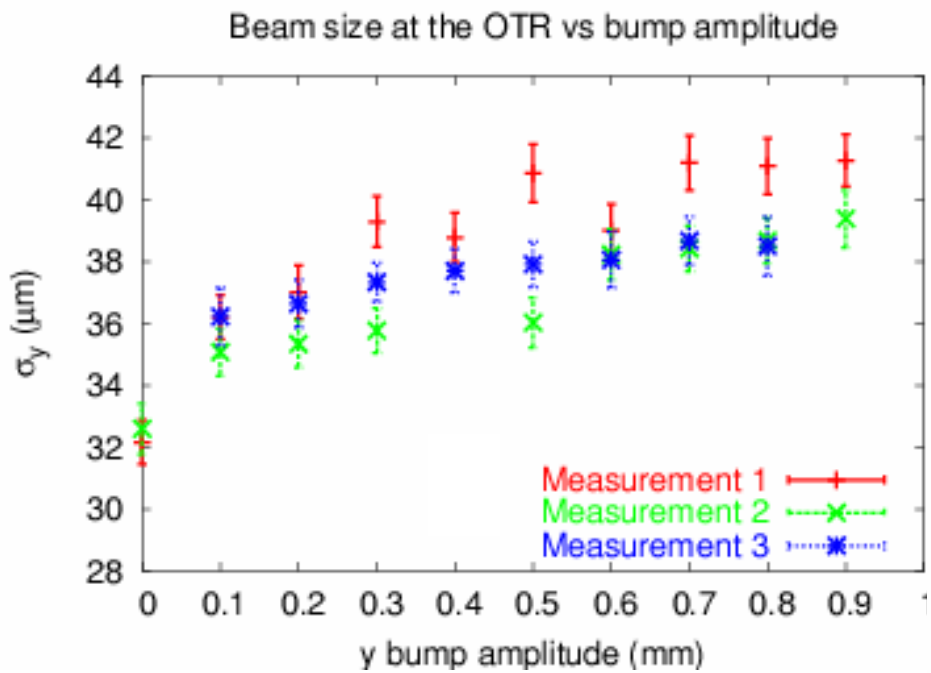
Preliminary results

3rd April 2008

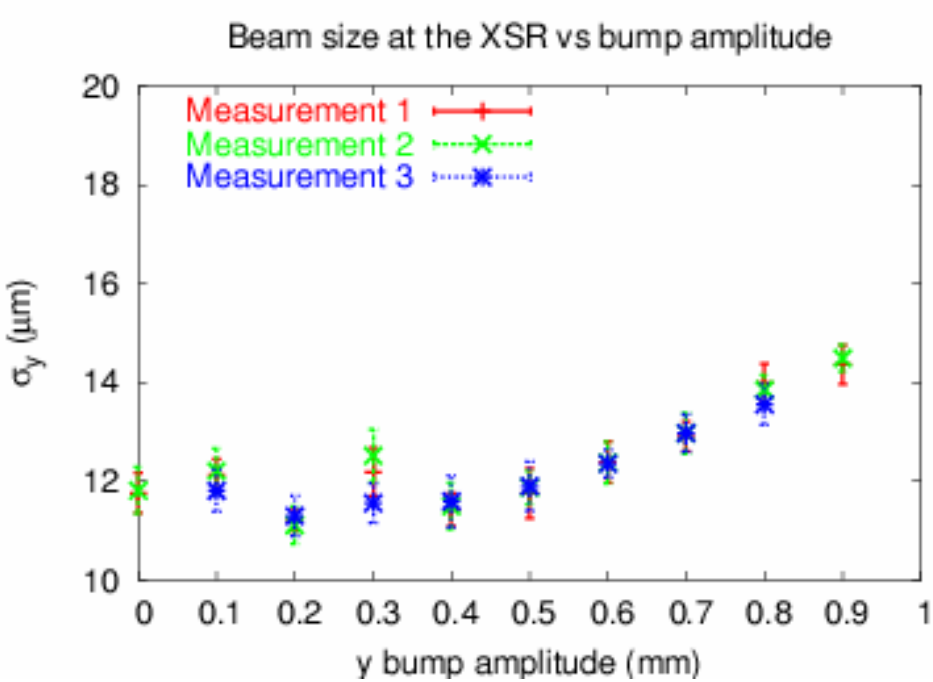
Emittance growth studies using static bumps in the ATF EXT line

Shift Tuesday 4th March 2008 (1:00 to 9:00 h)

Extraction Line (OTR)



Damping Ring (XSR)



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

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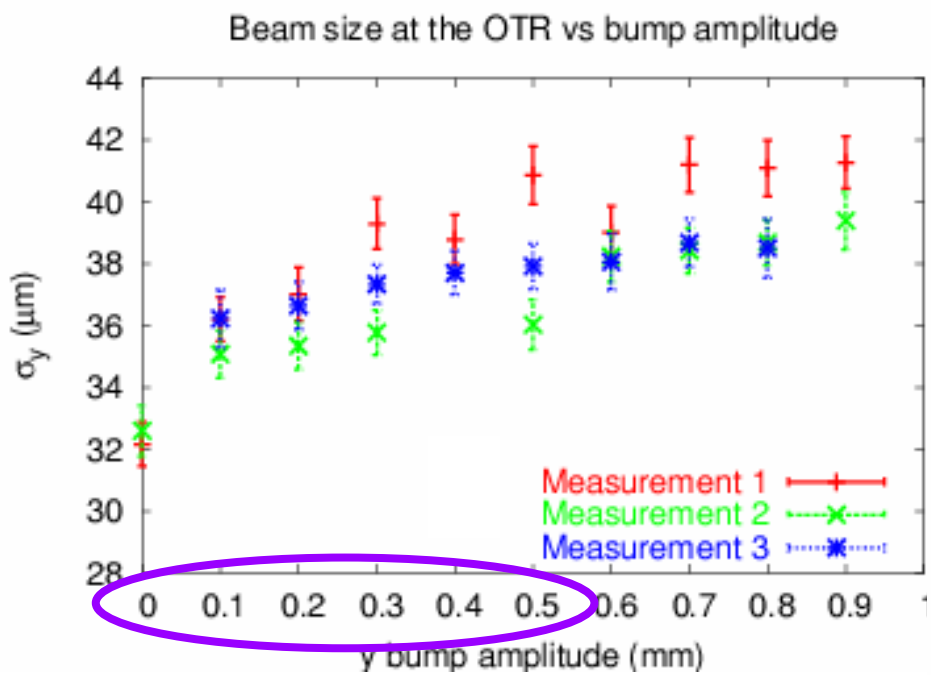

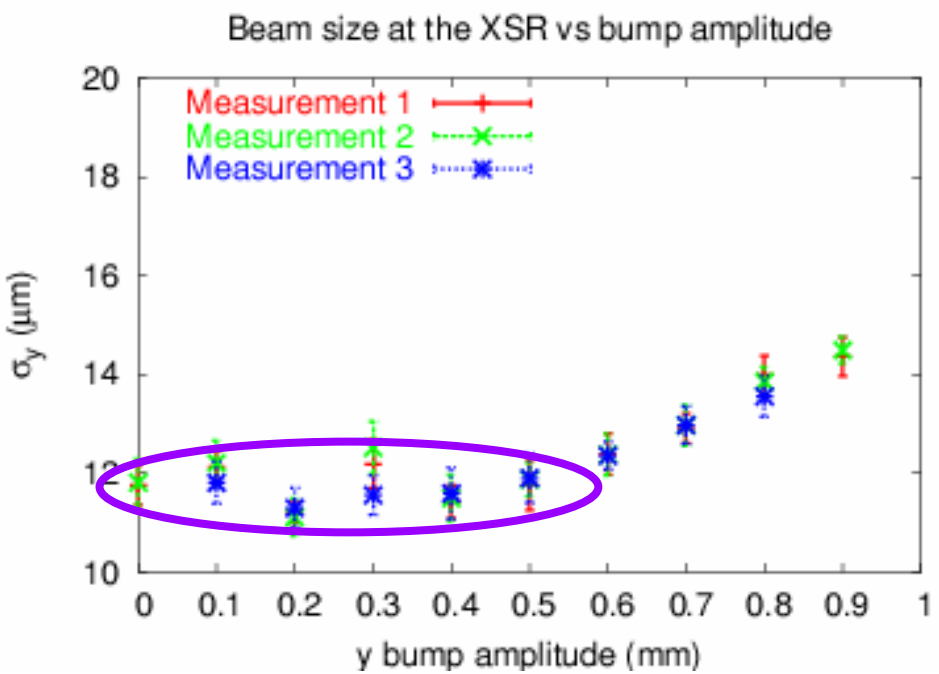

→ Assumption: from 0 to 0.5 mm bump, no effect in the DR → Let's consider this range

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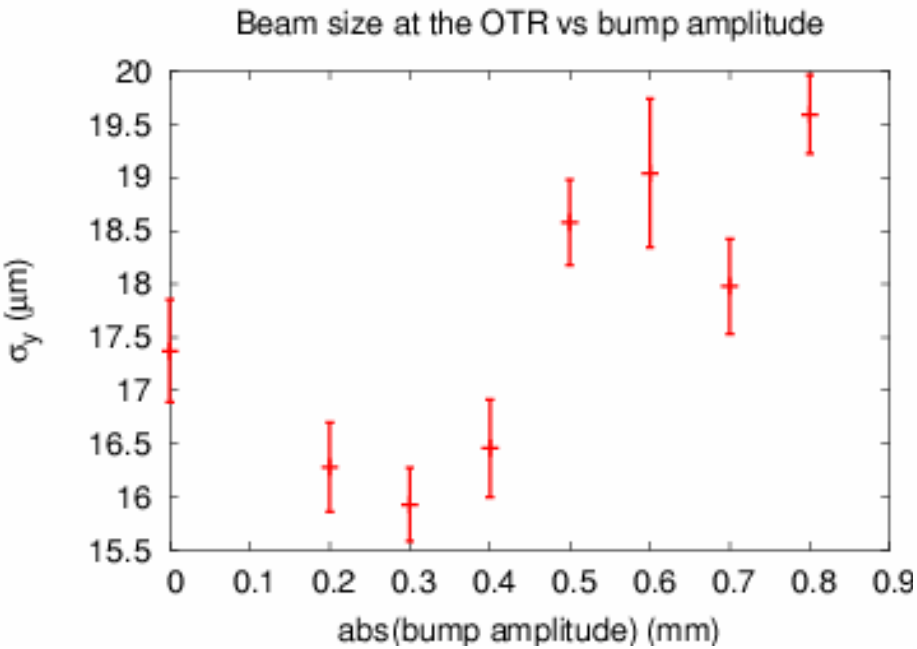
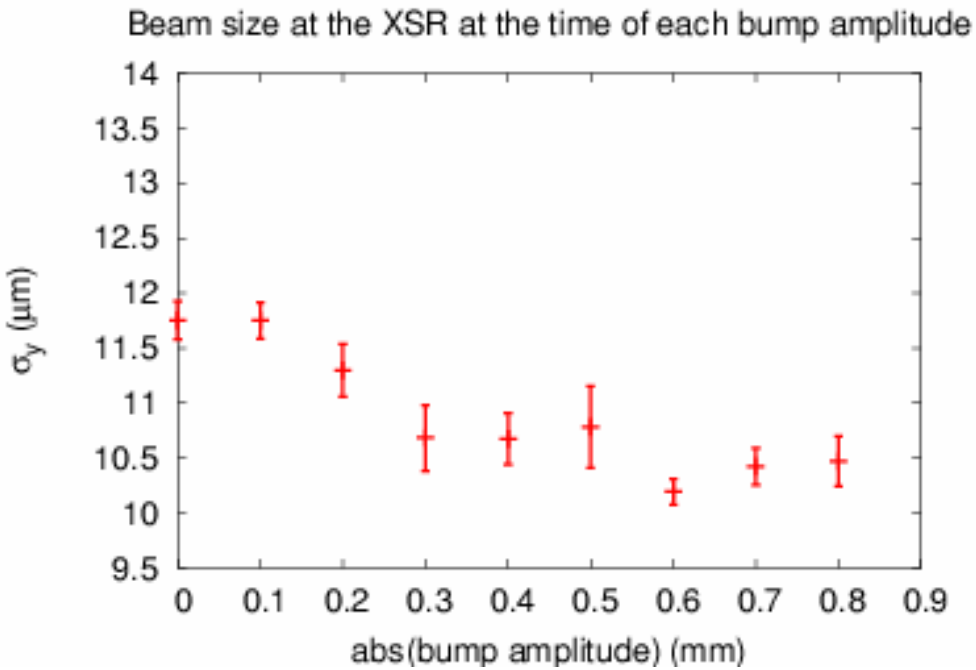
Emittance growth studies using static bumps in the ATF EXT line

Parasitic measurements 19th December 2007

Extraction Line (OTR)



Damping Ring (XSR)



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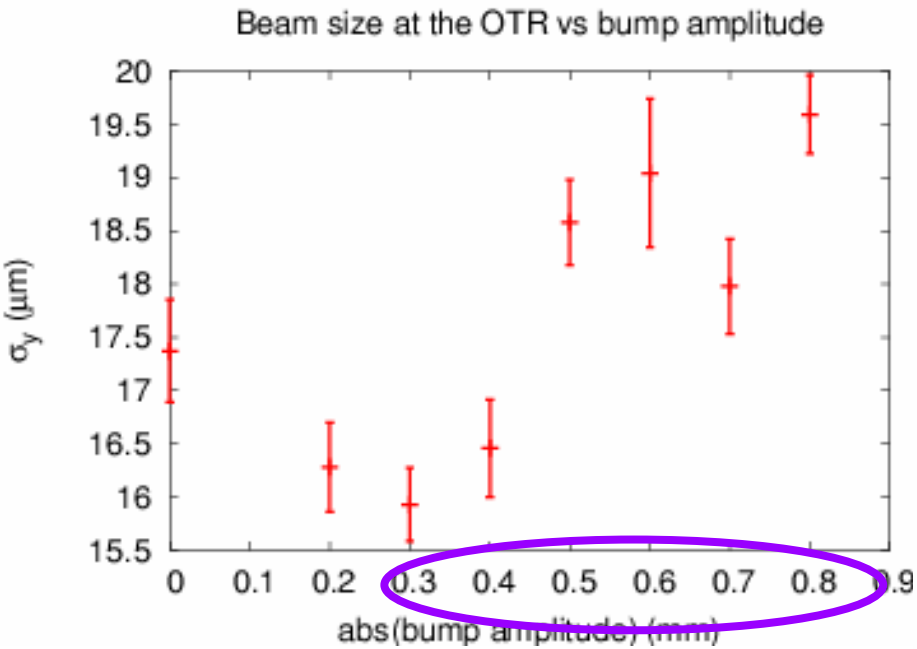
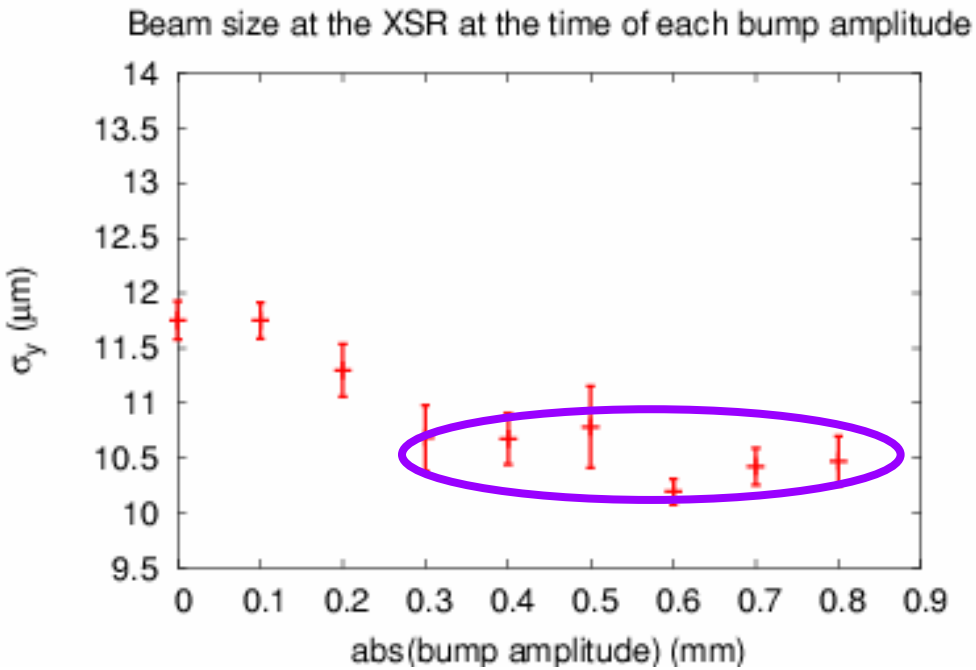
Parasitic measurements 19th December 2007

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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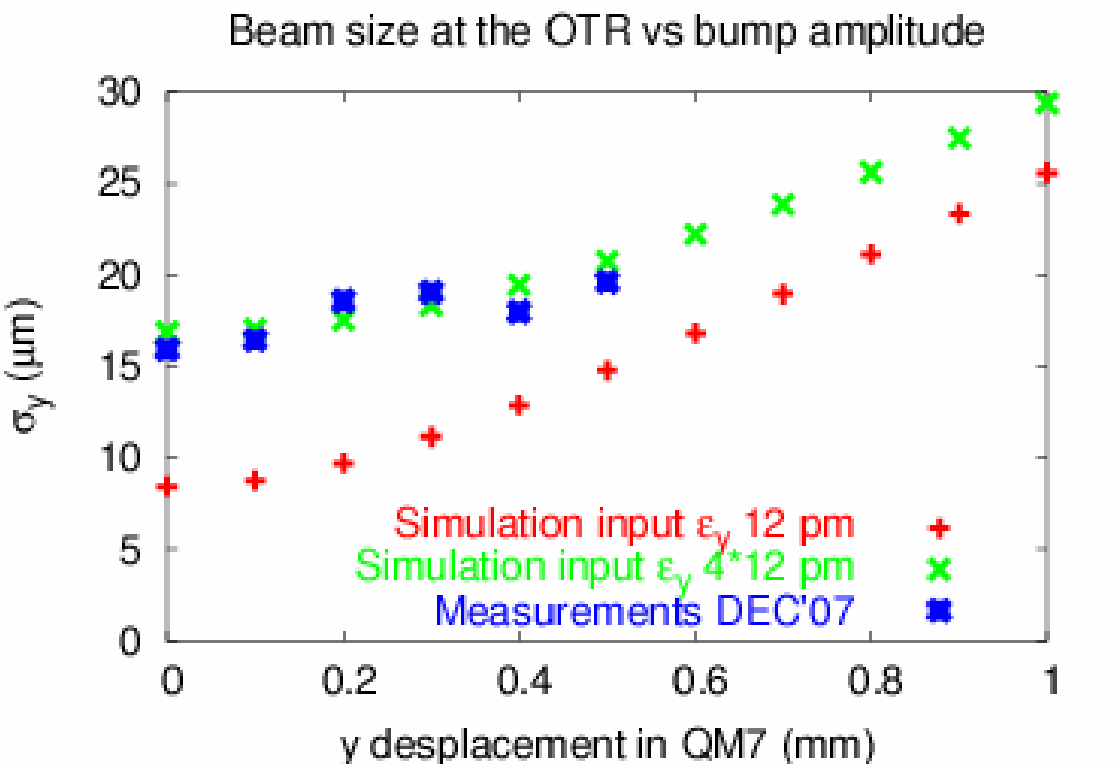
Tracking simulations in the Extraction Line

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



Considering 0.5 mm bump:

- with nominal input emittances, beam size increase in OTR is a factor ~1.8

-with ε_y 4 times nominal, beam size increase in OTR is a factor ~1.2 as in the measurements