

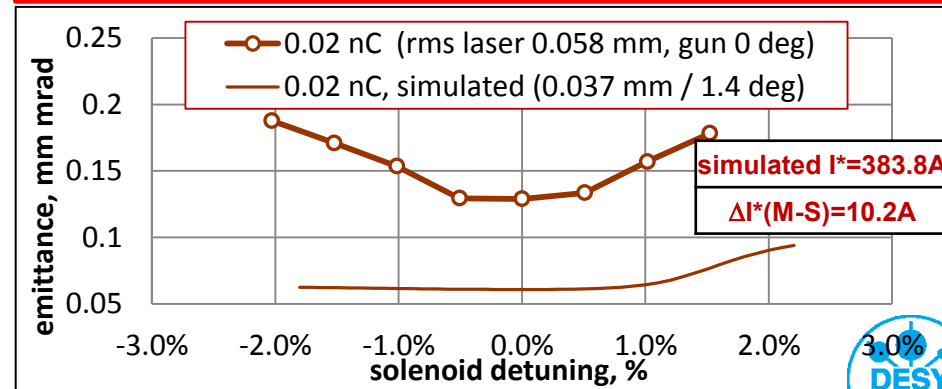
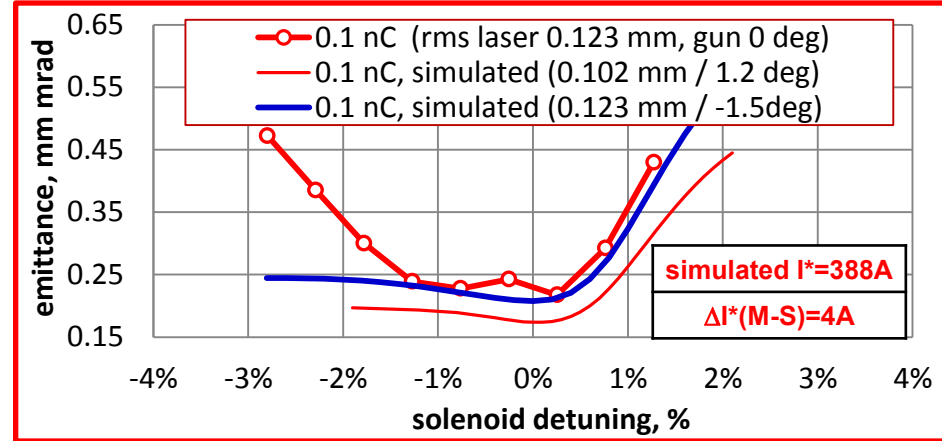
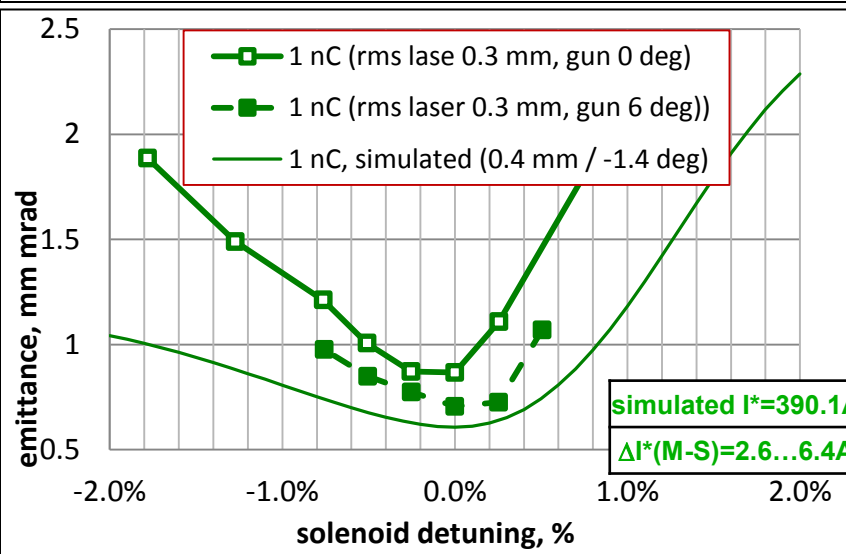
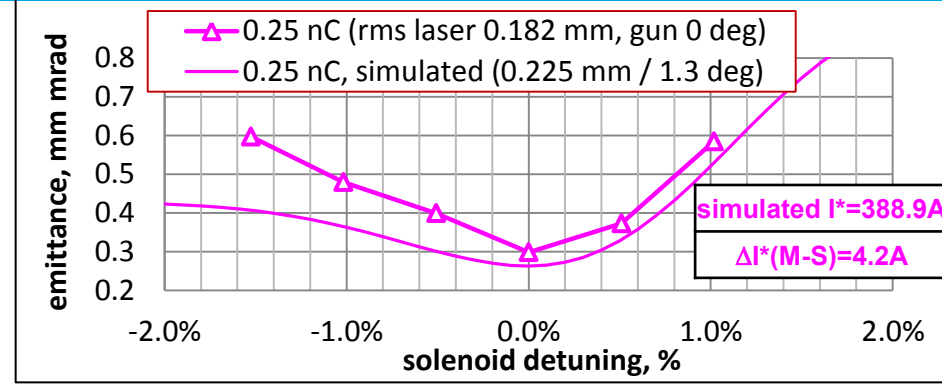
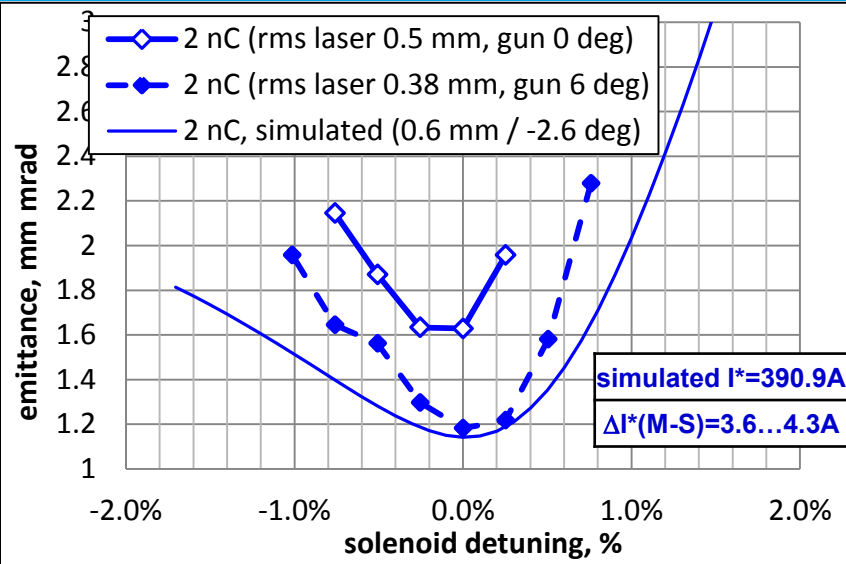
Some ideas/observations for simulations/measurements at PITZ-1.8

M.Krasilnikov, PPS, 05.01.2012

- To solenoid calibration
- E-beam tails
- Simulated emittance vs. gun phase for various bunch charges

Emittance vs. (I_{main}/I*⁻¹) for various bunch charges: M ↔ S

using calibration: $-B_z[T] = 0.00002516 + 0.00058424 \cdot I[A]$

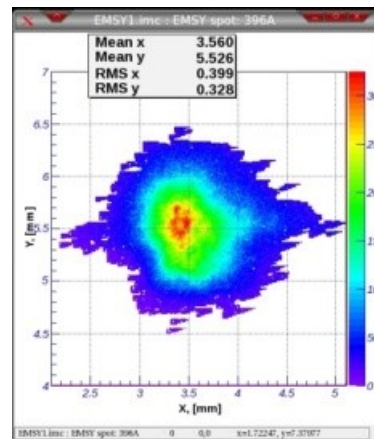
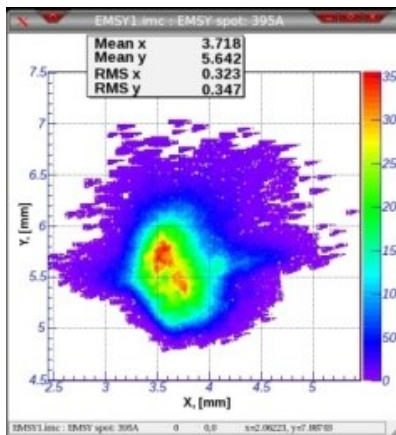


Emittance values → ~+
 Optimum solenoid current $\Delta I(\text{meas-sim}) \sim 4A!$



Problems

- Simulated optimum machine parameters (laser spot size and RF gun phase) \neq to those obtained experimentally
- Photo emission (bunch charge) needs more detailed modeling in simulations
- Tails (\sim horizontal) in the beam distribution:
 - X-Y asymmetry
 - Beamlets from tails are not detectable)

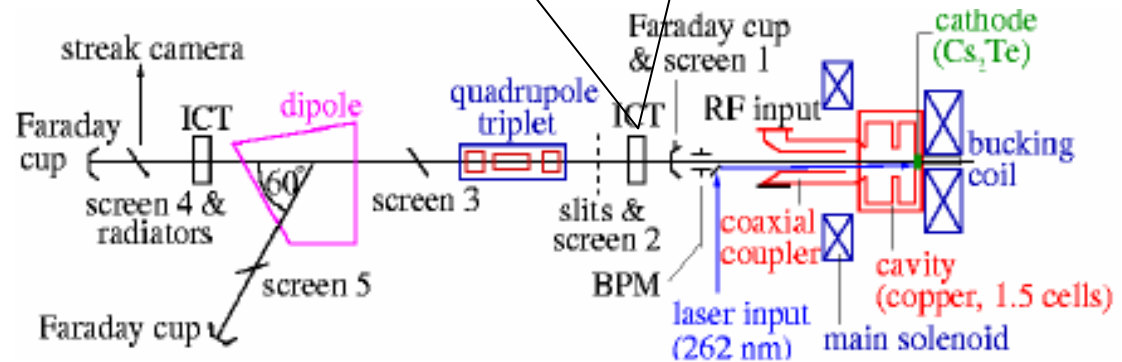
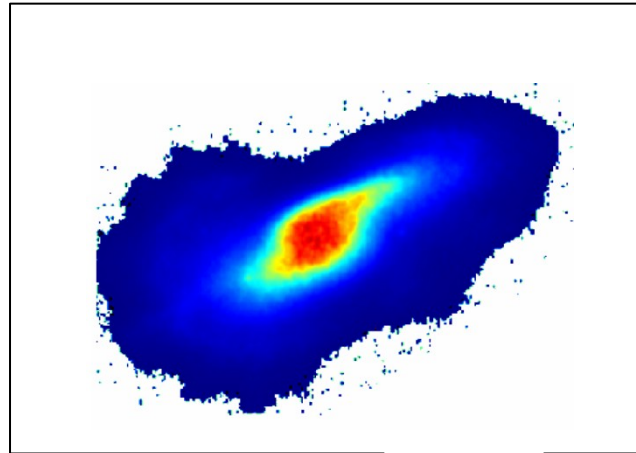
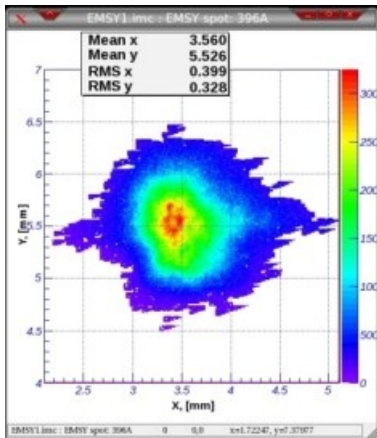
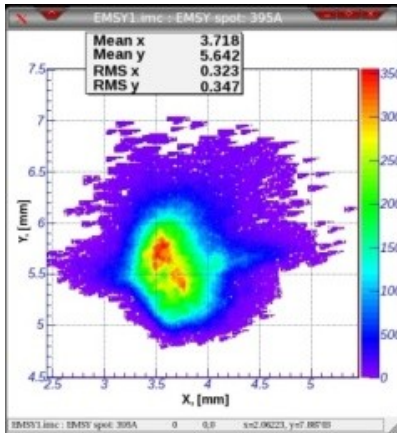


??Reasons:

- Remaining magnetizable components
- Vacuum mirror
- Solenoid imperfection
- Stray fields from IGPs
- ...

E-beam tails (beam at EMSY1)

2011



Year 2003: Ecath=42MV/m; Pz~4.7MeV/c; z=1.618m

Simulated tolerances for various bunch charges

