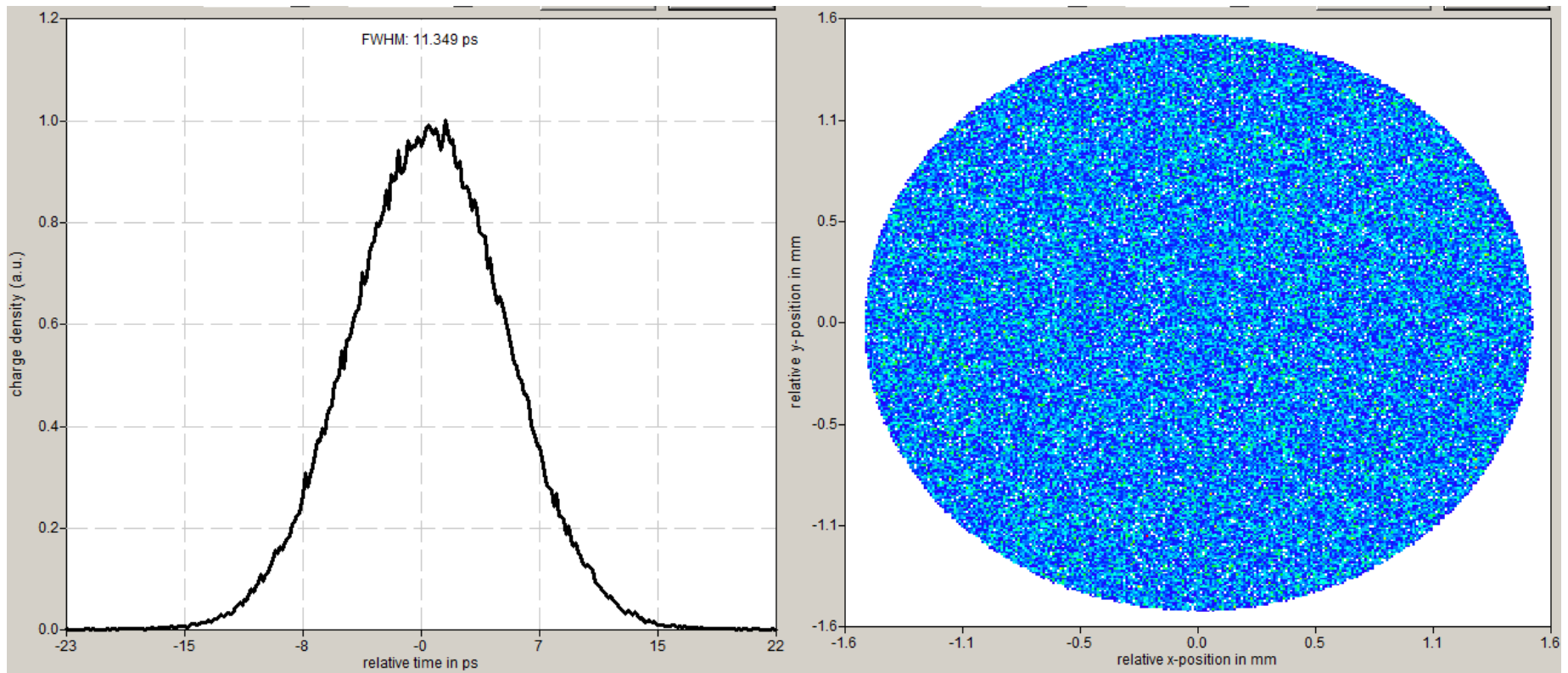


Emittance simulations for 500 pC charge and Gaussian laser temporal profile of 11.5 ps FWHM.

G. Vashchenko
14.01.2016

- Laser profile
 - Longitudinal: Gaussian with 11.5 ps at FWHM
 - Transverse: Uniform of different sizes



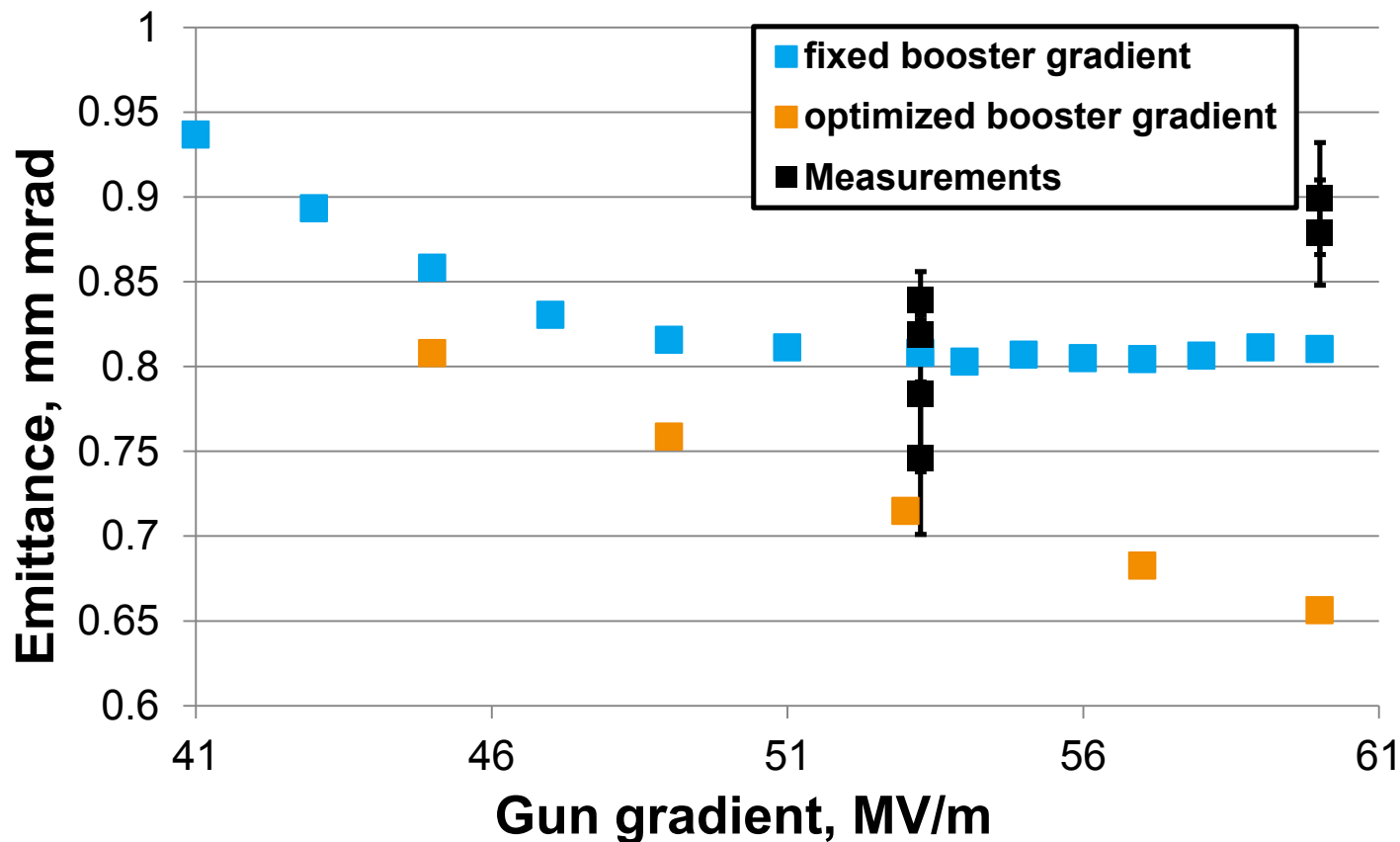
Blue points on the next slide

- For each gun gradient
 - Simultaneous optimization of laser spot size on the cathode, gun launching phase and main solenoid current
- Booster gradient is fixed to 17.1 MeV/c to match the experimental conditions
- Optimization goal: minimum emittance at the position of EMSY1 (5.27 m)

Orange points on the next slide

- For each gun gradient
 - Simultaneous optimization of laser spot size on the cathode, gun launching phase, main solenoid current and booster gradient
- Optimization goal: minimum emittance at the position of EMSY1 (5.27 m)

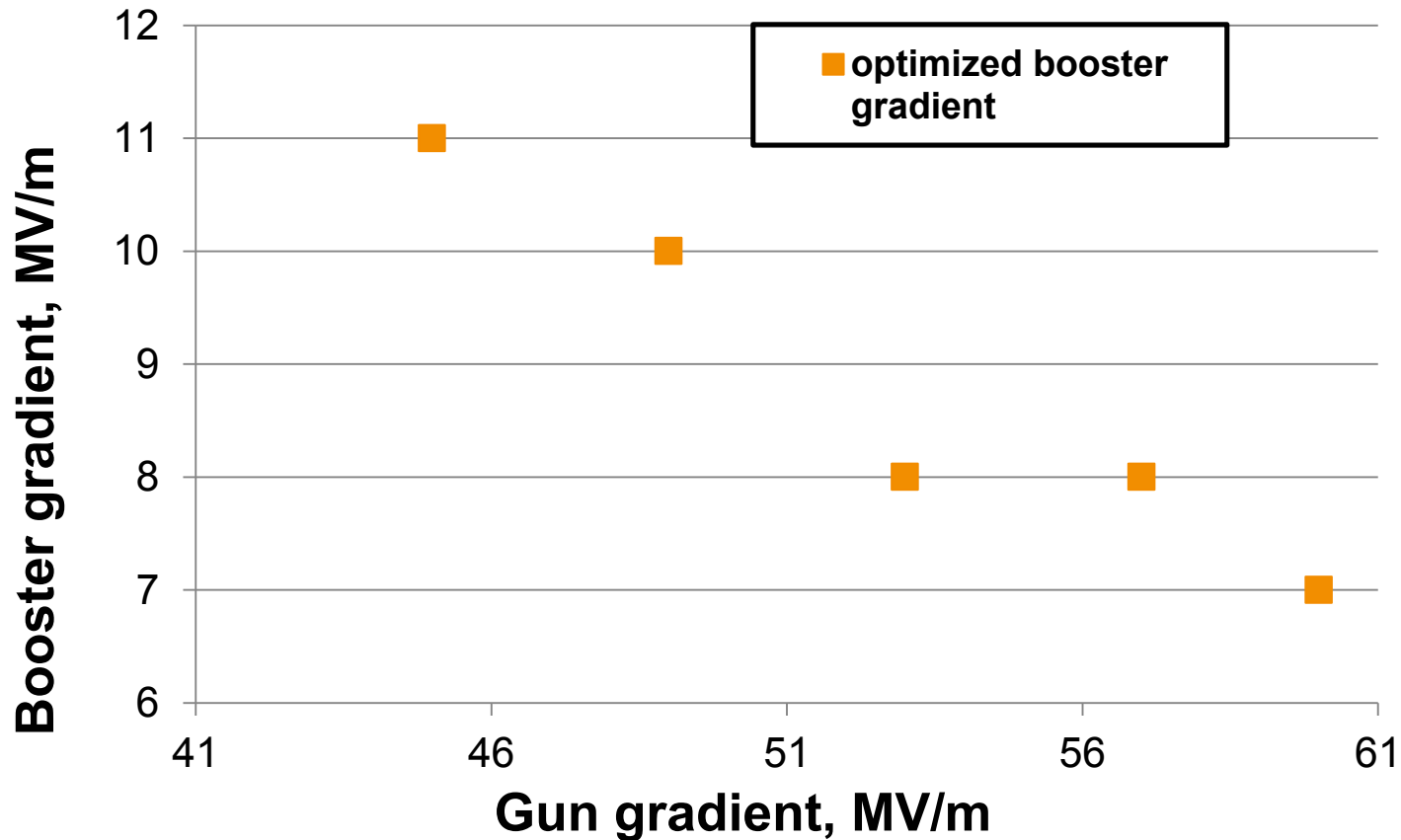
500 pC, 11.5 ps Gaussian laser



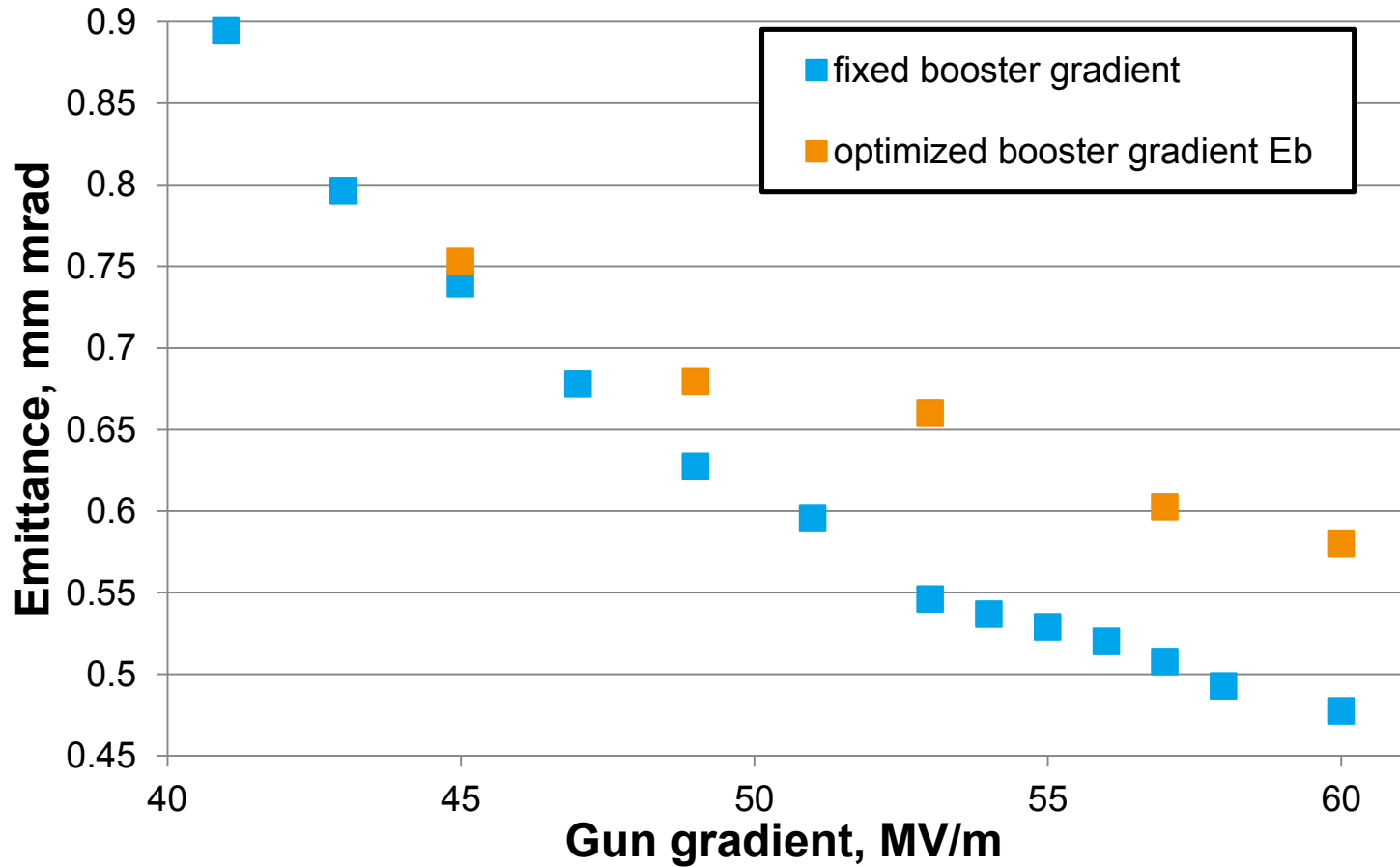
Measurements are done at fixed booster gradient that corresponds to blue points. Statistical error bars are shown

Obtained booster gradient which yields to the minimum emittance

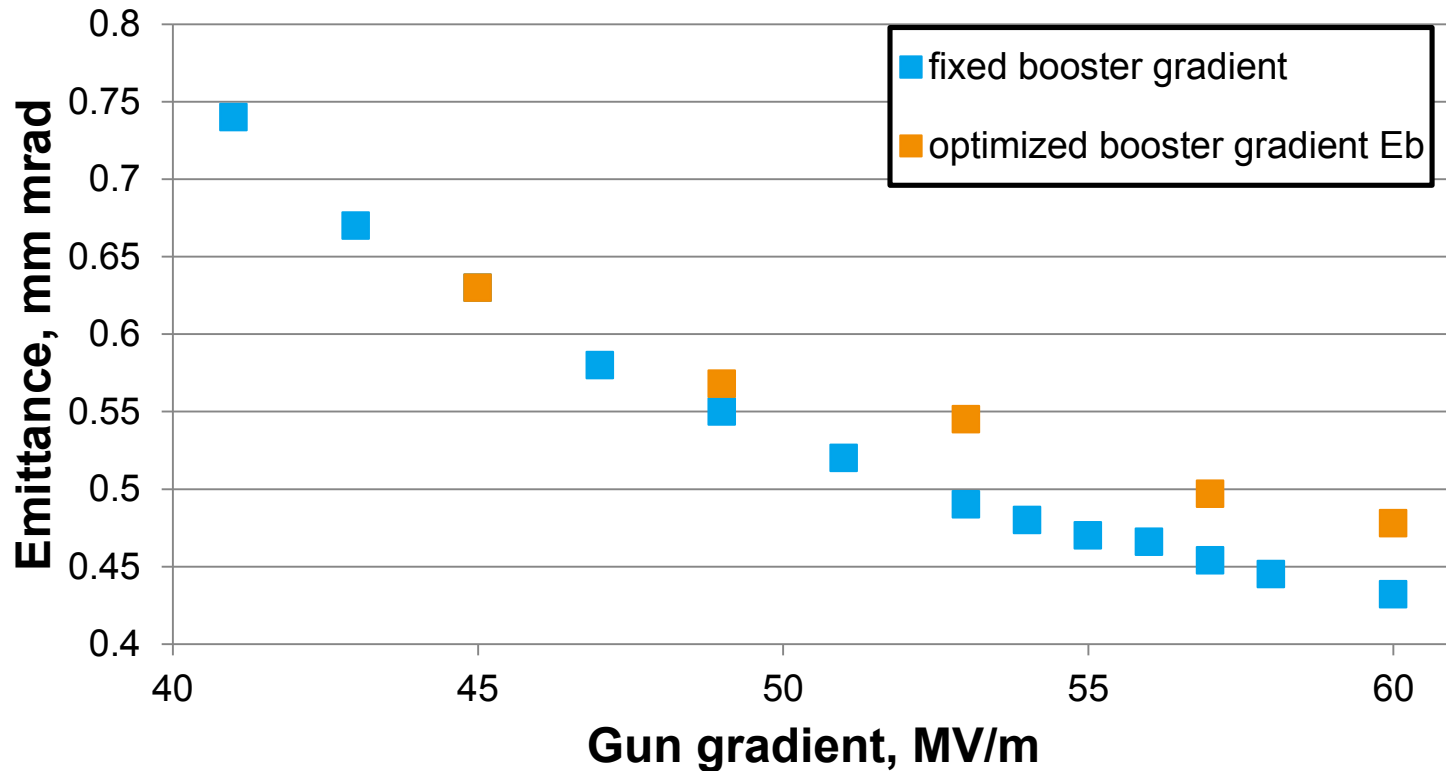
500 pC, 11.5 ps Gaussian laser



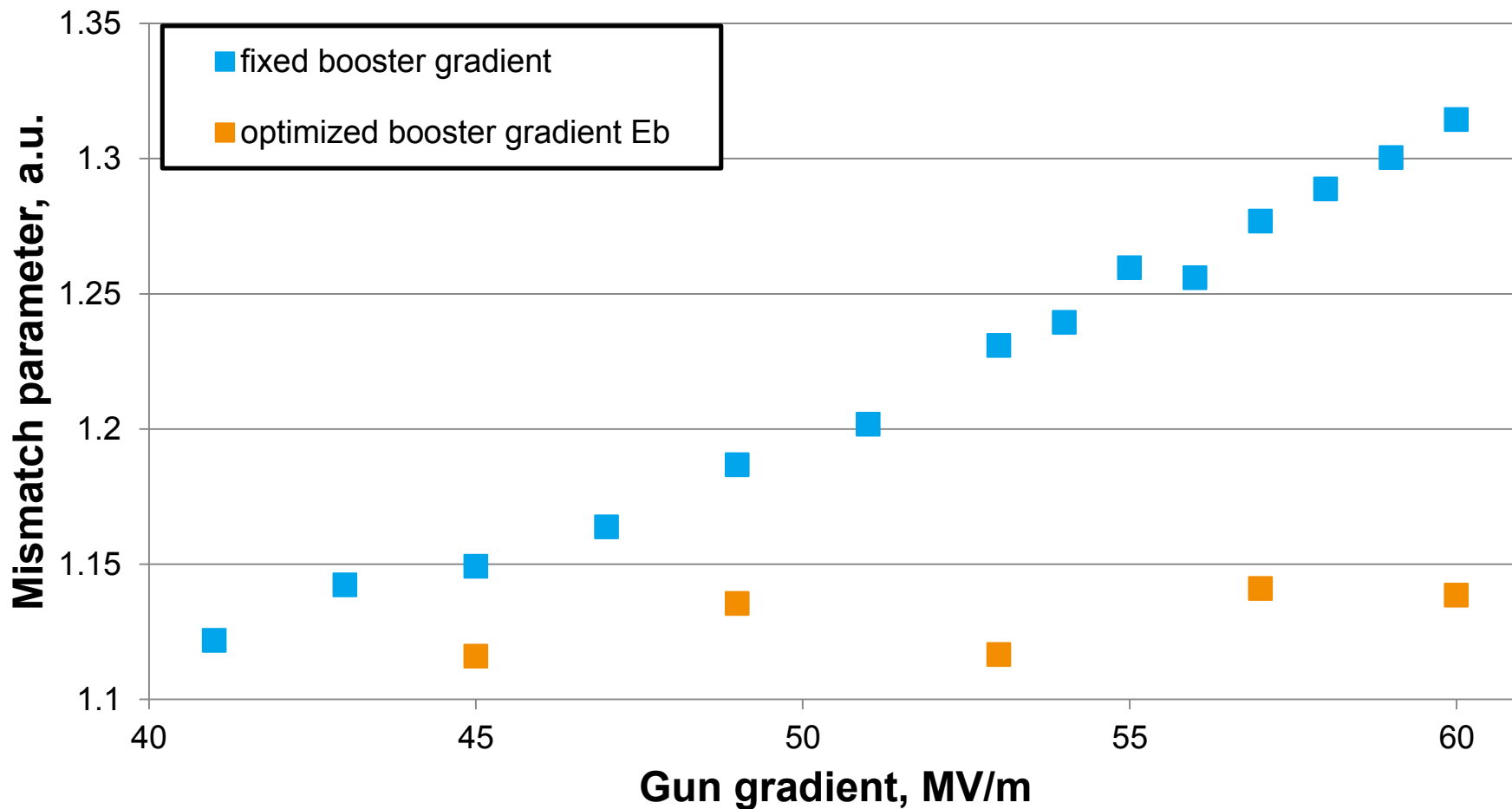
Average slice emittance in slices 6-15



Average and weighted with beam current slice emittance in all slices



Average mismatch parameter over all 20 slices



Weighted with beam current mismatch parameter over all 20 slices

