

Noise in electron bunches FAST beam parameters (2022 run)

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Proposed FAST Beam parameters

- Beam energy ~ 45 MeV
- Beam emittance (rms, n) ~ 4 μm (depends on a bunch charge)
- Bunch charge 0.1 – 2 nC (~ 1 nC)
- Bunch length (rms) ~ 6 mm (at 1 nC)
- Desired peak currents: 7 - 15 A

	FAST	EIC (100 GeV)	EIC (275 GeV)
Electron beam energy	50 – 300 MeV	50 MeV	137 MeV
Bunch charge	0 – 3 nC	1 nC	1 nC
Emittance (norm, rms)	~ 3 μm (at 1 nC)	2.8 μm	2.8 μm
Bunch length	0.3 – 20 mm	14 mm	7 mm
Drift section (amplifier)	80 m	100 m	100 m

Bunch length

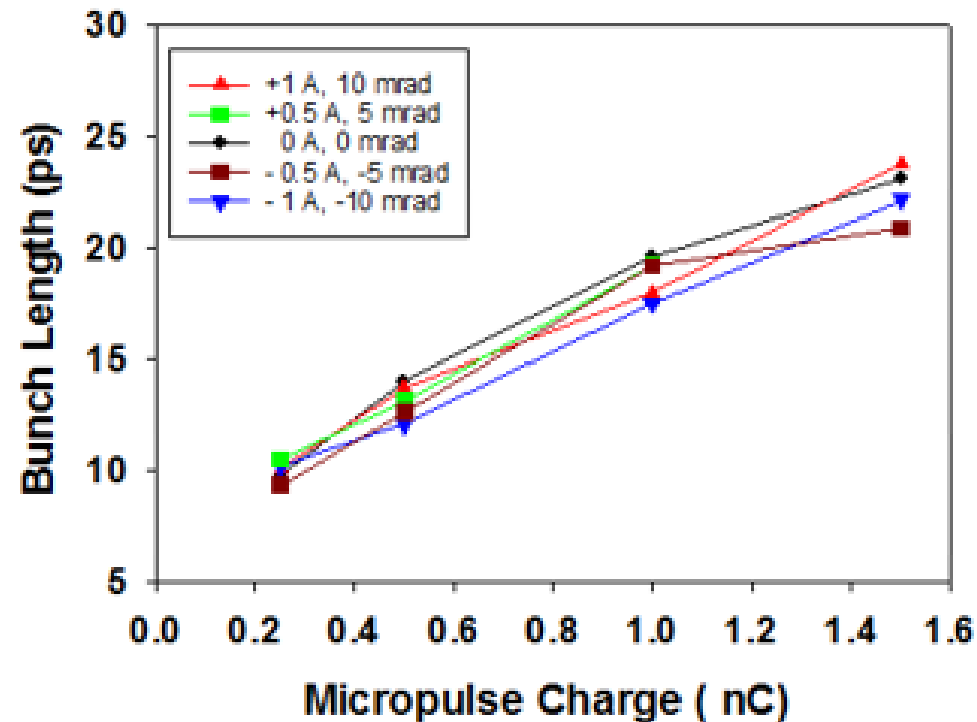


Figure 4: Streak camera bunch length versus charge results during the V101 corrector scan from -1.0- to +1.0-A values. At 4.5 MeV, a 1-A current change corresponds to a 10-mrad angular change into CC1. The transverse laser spot is ~ 0.5 mm in x and y in this case.

X121 cross



<https://journals.aps.org/prab/abstract/10.1103/PhysRevAccelBeams.23.054401>