S2E simulation for XFEL

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DESY

Plan in last month (2013. 08. 12)

- Writing a report for BBA in XFEL

- S2E simulations with ASTRA+ELEGANT+GENESIS for XFEL
  - Genesis simulations with more random seeds
  - Including the impedance database of XFEL (Z. Olga)

- RF tolerance

Achieved works in previous plan

- Writing a report for BBA in XFEL
  - 95 %
- S2E simulations with ASTRA+ELEGANT+GENESIS for XFEL
  - 100 %
- RF tolerance
  - 50 %

RF tolerance

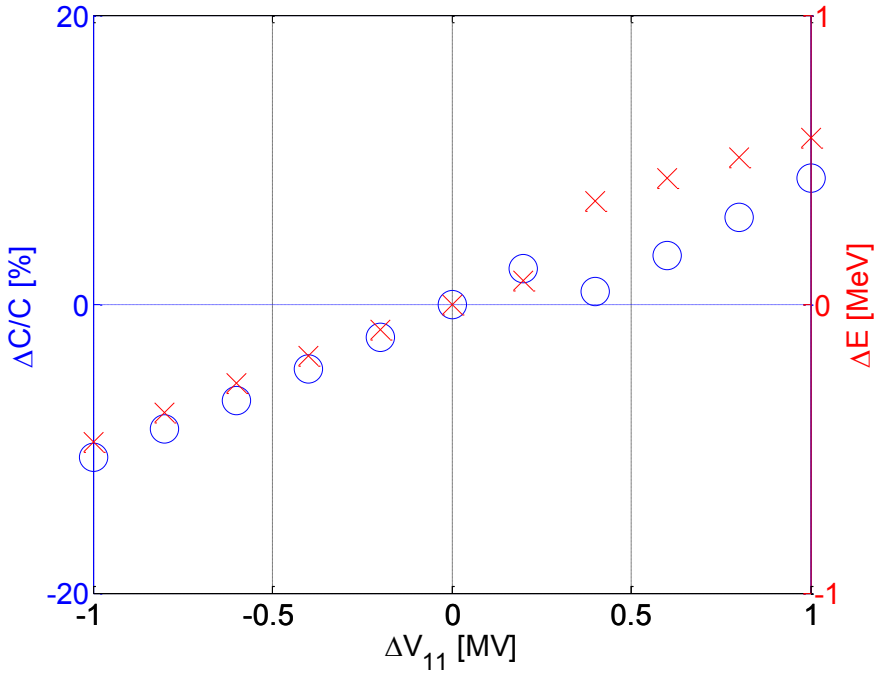
- Plan
  - Change a voltage or phase of RF cavity

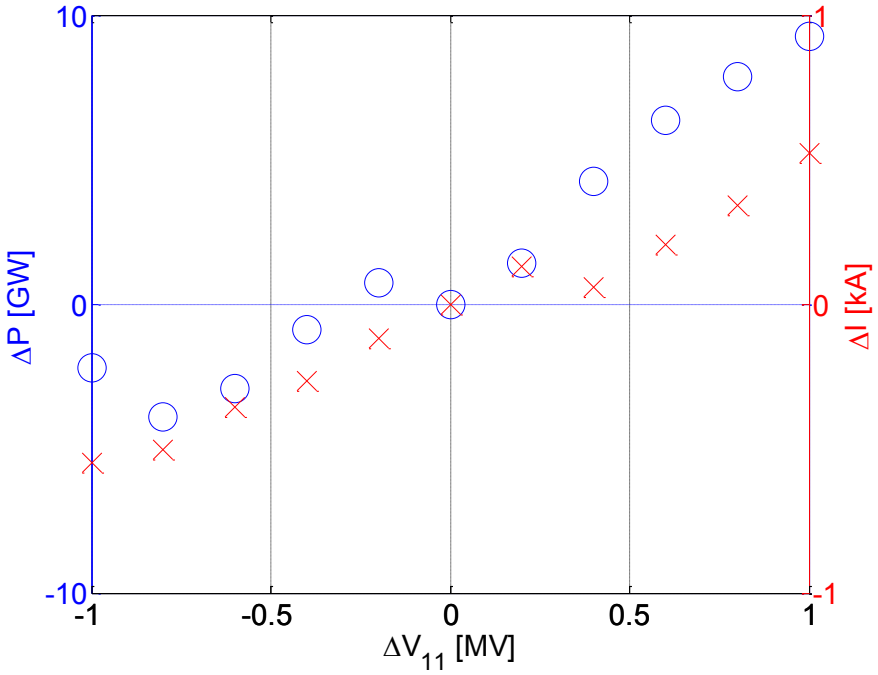
  → changes of total compression (after BC2), peak current (before SASE1), beam energy (before SASE1), and radiation power (at SASE1)

- Beam
  - 500 pC

V_{11} [MV]	ϕ_{11} [deg]	V_{13} [MV]	ϕ_{13} [deg]	V_2 [MV]	ϕ_2 [deg]	V_3 [MV]	ϕ_3 [deg]
153.8	16.9	23.8	186.0	657.4	29.8	1810.5	20.0

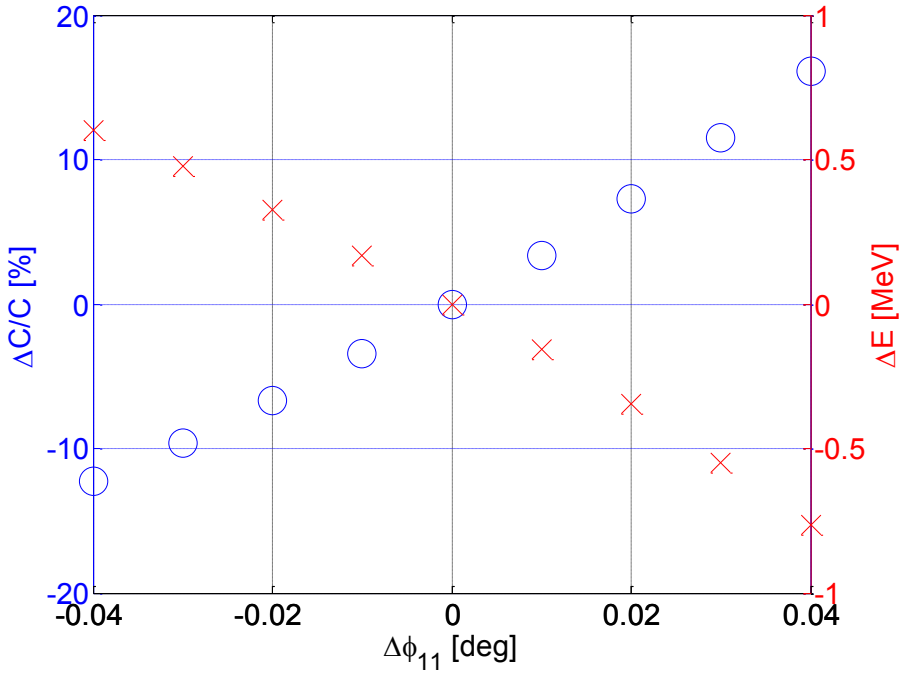
RF tolerance : ACC1 – V_{11}

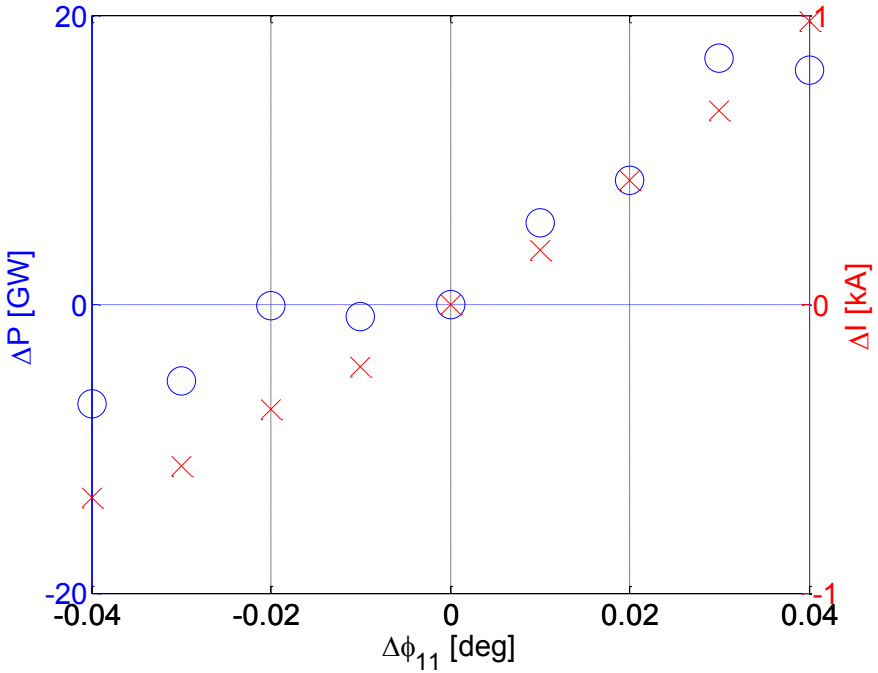




10% change of total compression : $|\Delta V_{11}| \sim 1.094$ MV

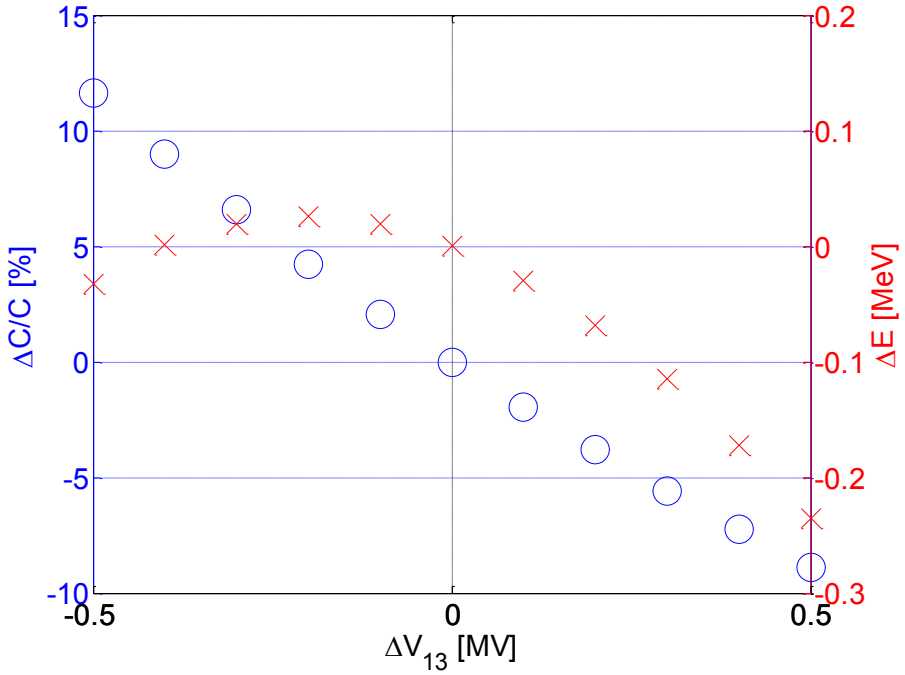
RF tolerance : ACC1 – ϕ_{11}

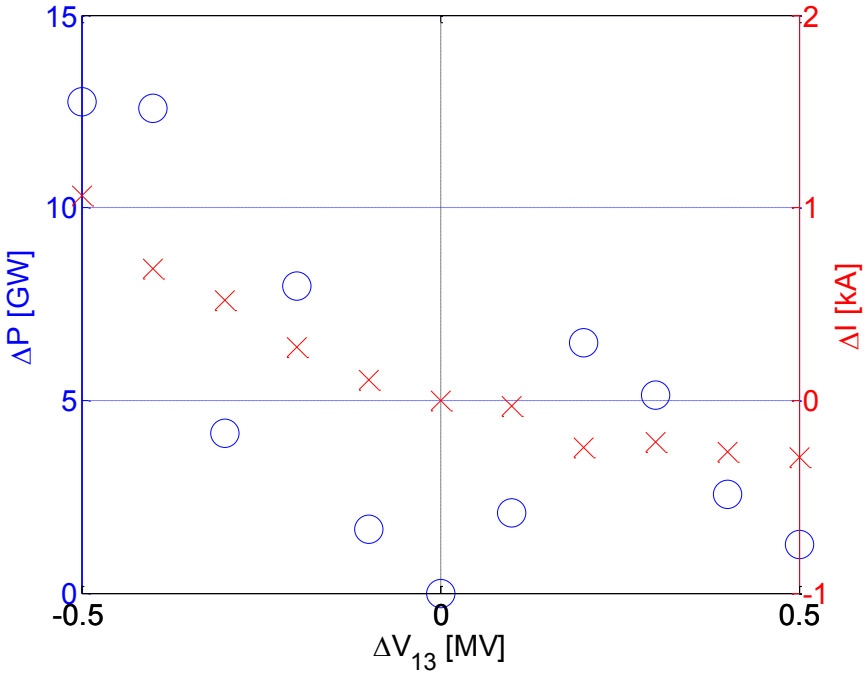




10% change of total compression : $|\Delta\phi_{11}|$ ~ 0.0284 [deg]

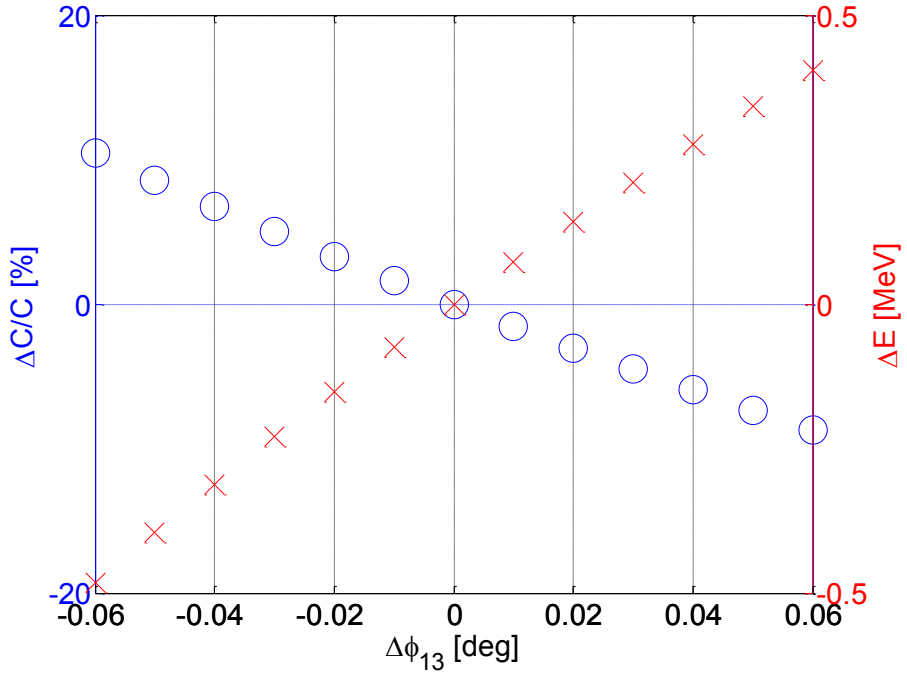
RF tolerance : ACC39 – V_{13}

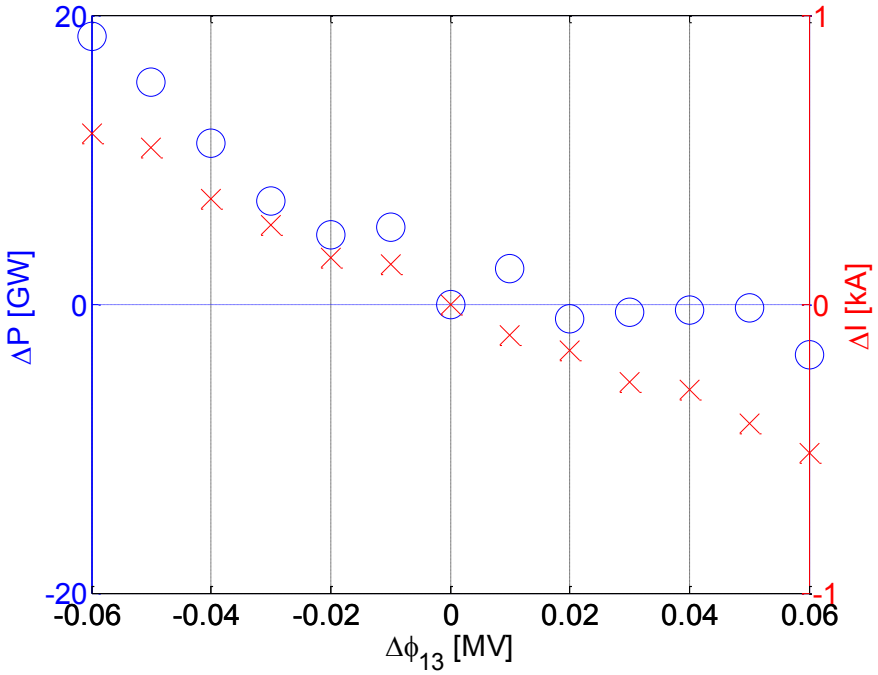




10% change of total compression : $|\Delta V_{13}| \sim 0.491$ MV

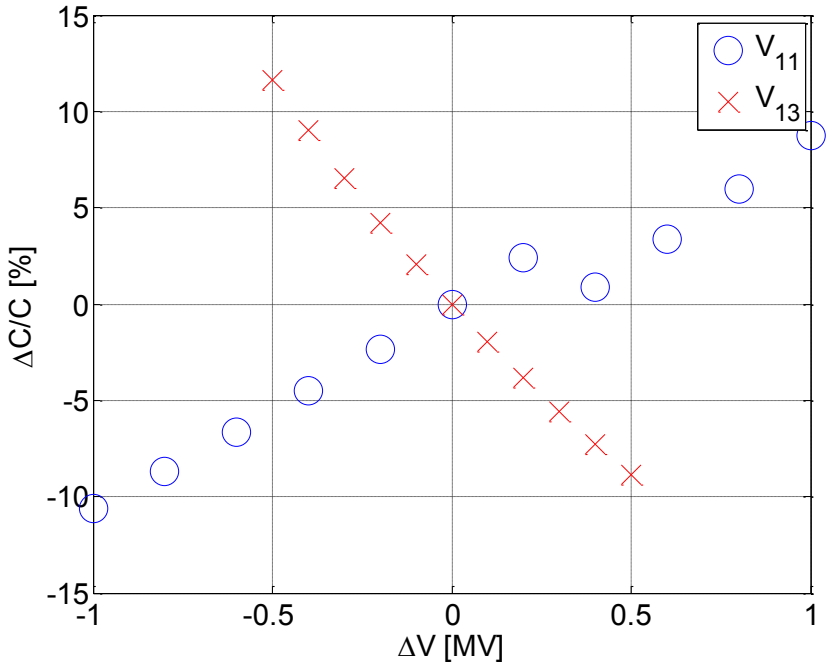
RF tolerance : ACC39 – ϕ_{13}

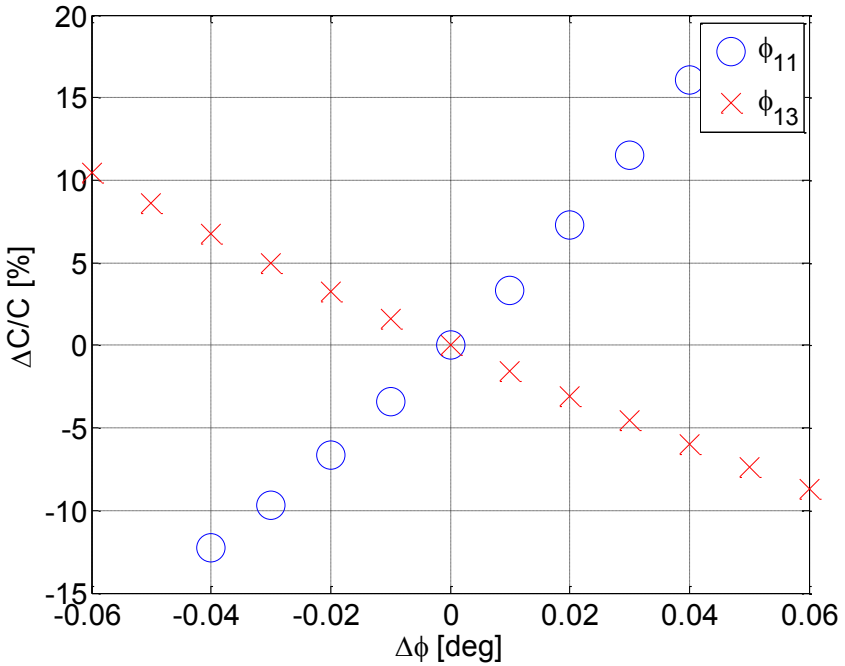




10% change of total compression : $|\Delta\phi_{13}| \sim 0.0628$ [deg]

RF tolerance : comparison of ACC1, ACC39





	$\lvert\Delta V_{13}\rvert$ [MV]	$\lvert\Delta\phi_{13}\rvert$ [deg]
ACC1	1.094	0.0284
ACC39	0.491	0.0628

Plan in next month

- RF tolerance
  - More random seeds in genesis simulation
  - Check for V2, $\phi 2$