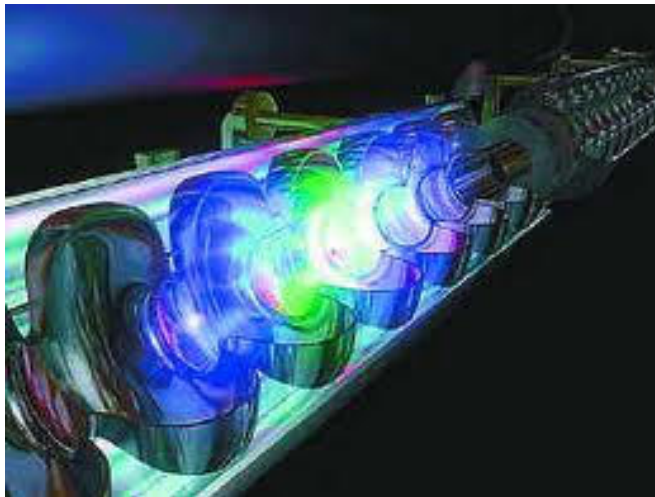# Results and Plans for May 2013

Start-to-End Simulations

Igor Zagorodnov

Deutsches Elektronen Synchrotron,
Hamburg, Germany

S2E Meeting, DESY
14. May 2013

HELMHOLTZ
| GEMEINSCHAFT

DESY

Plan/Results for April 2013

❑ FLASH simulations for low energy spread (**done for 1nC**)
❑ XFEL siulations with Elegant and for the whole machine (**10 %**)
❑ Webpage design (**1 new result**)
❑ ALICE 1.1 with intersections (**testing**)

S2E for FLASH2 line at z=194 m (Q=1nC)

1) the global slice length: ~15 um slice = 50 fs
   - Slippage in Modulator ~ 4 um
   - Slippage in Radiator ~10 um
* Within this slice, the energy spread should be smaller than 100 keV

2) min current along the global slice: Should exceed at least 0.5 kA

3) how large can be the variation of the current along the global slice:
most important to assure min. 0.5 kA.

4) maximal local slice emittance along the global slice?:
1.5 um

5) maximal local (uncorrelated) energy spread: ~100 keV

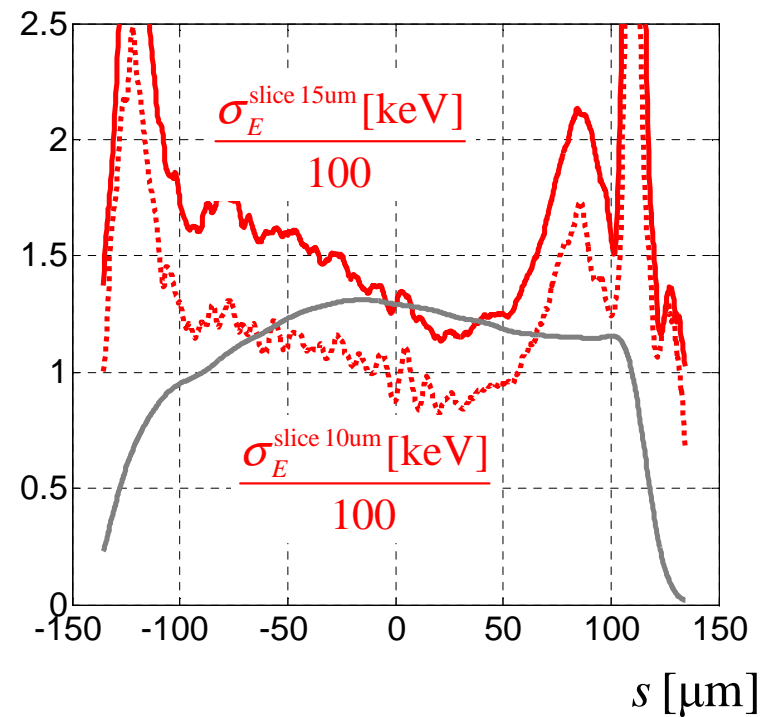6) maximal energy chirp (correlated energy spread) along the global
slice? ~150 keV (??)

s [μm]
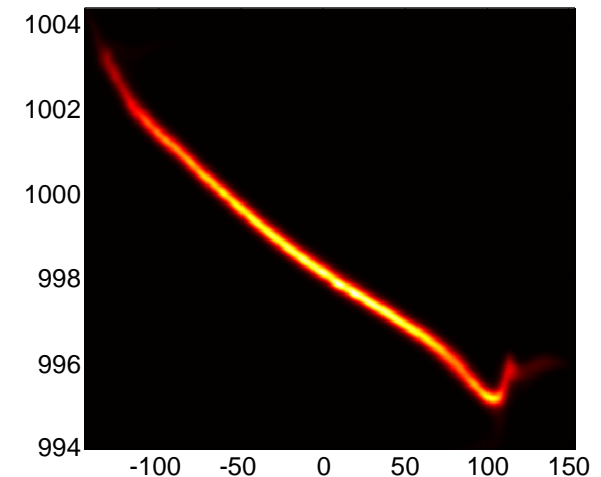
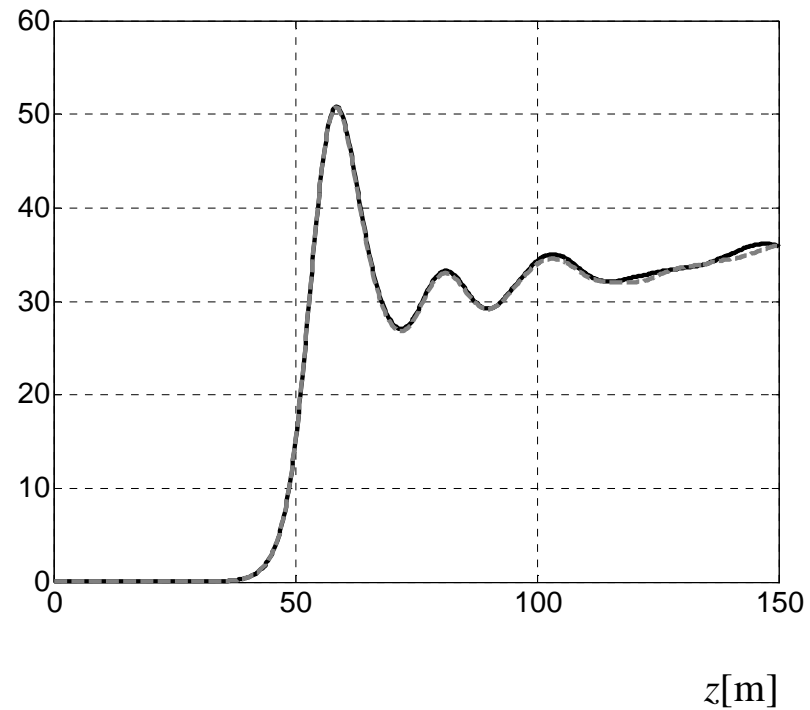# S2E for FLASH2 line at z=194 m (Q=1nC)

uncorreleted energy spread
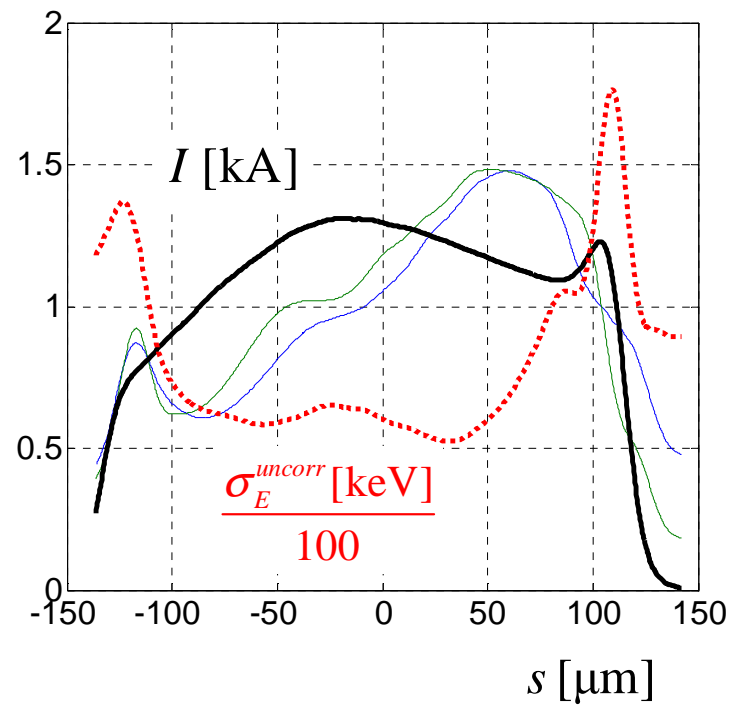
energy spread in slice of length 10 um and 15 um

Intersections in FEL code
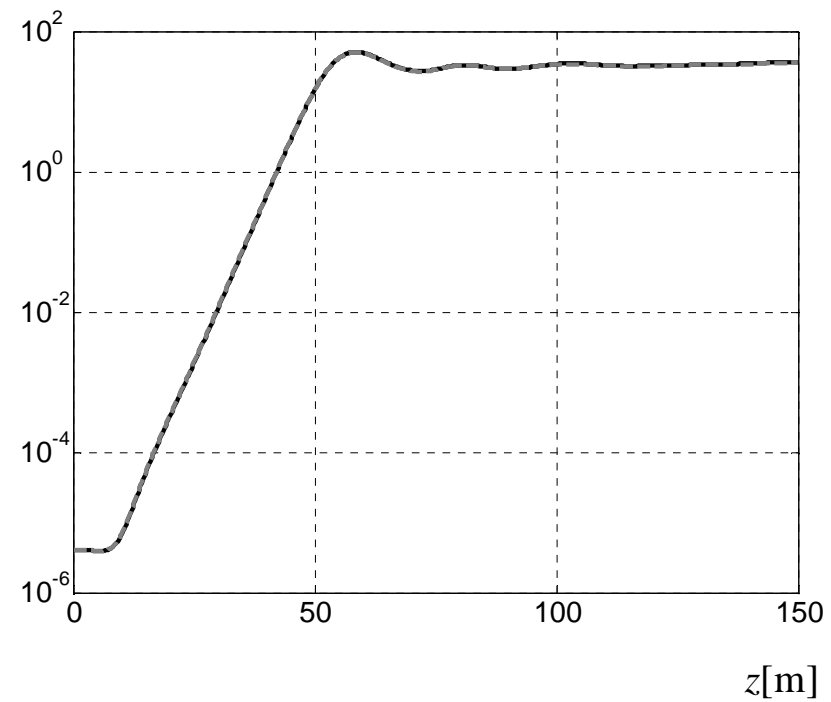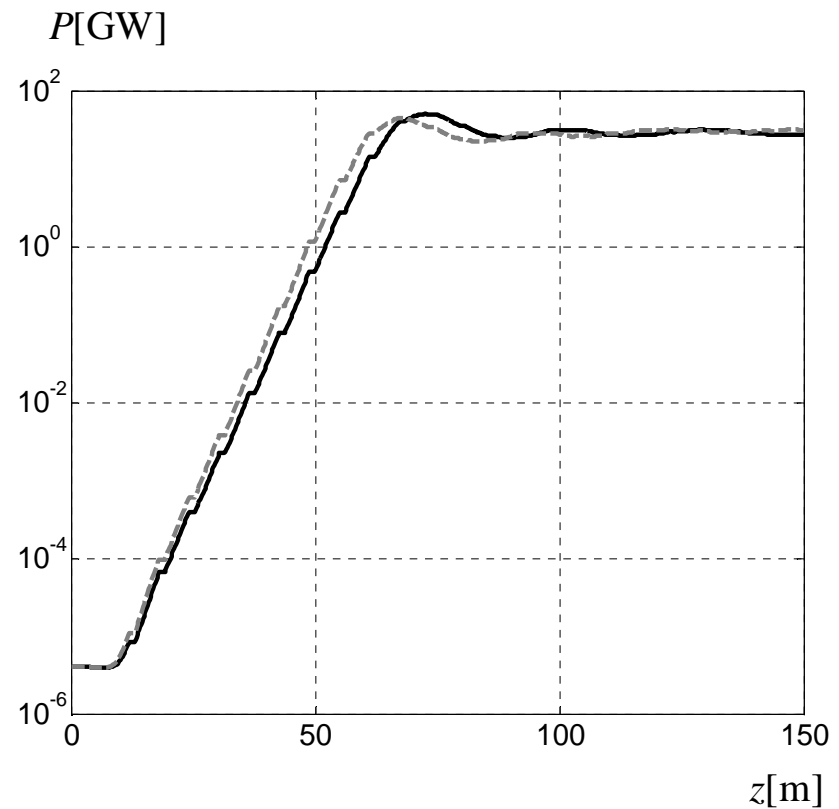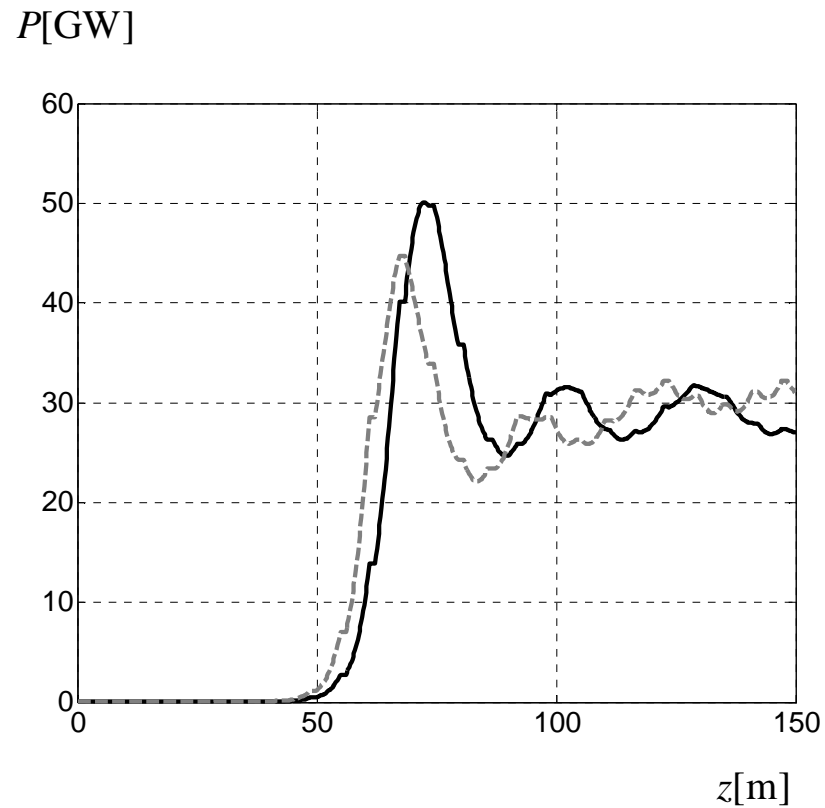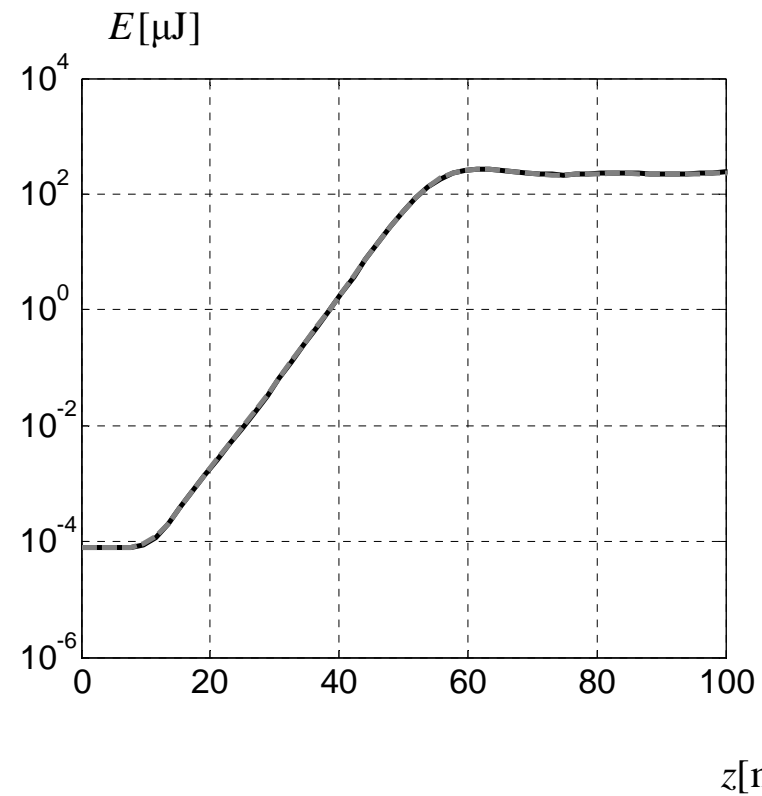
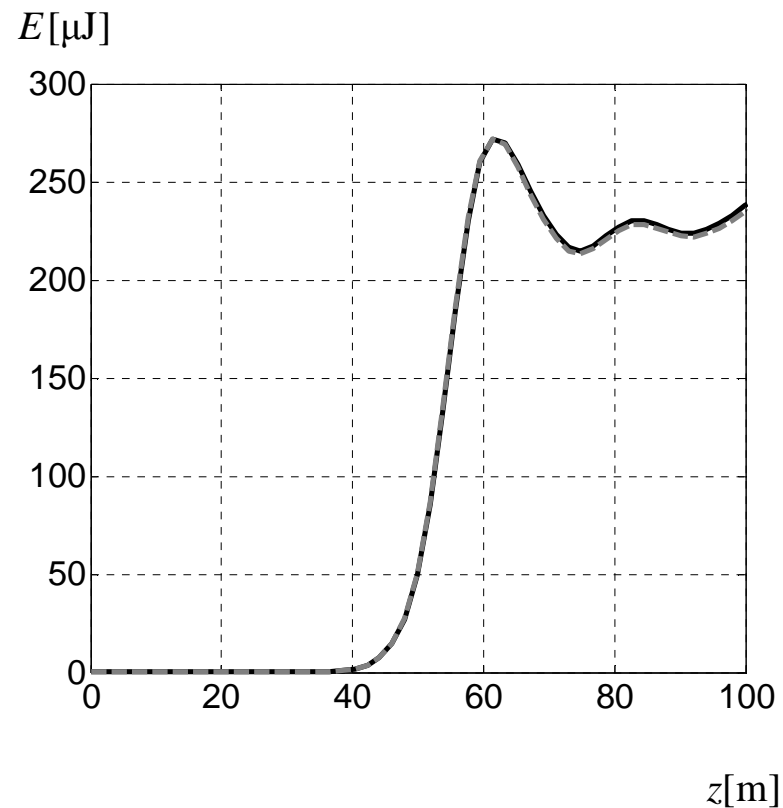ALICE and Genesis (v. 2.0) without intersections

Intersections in FEL code
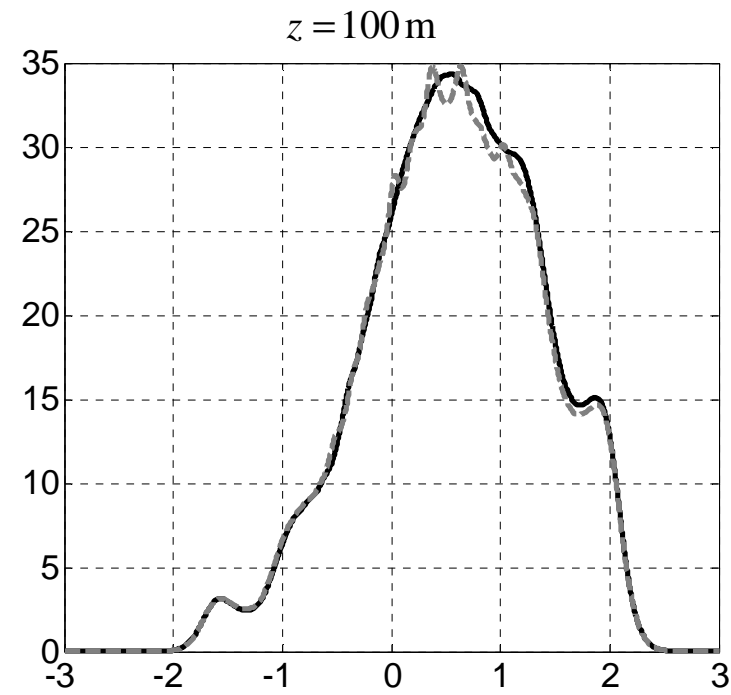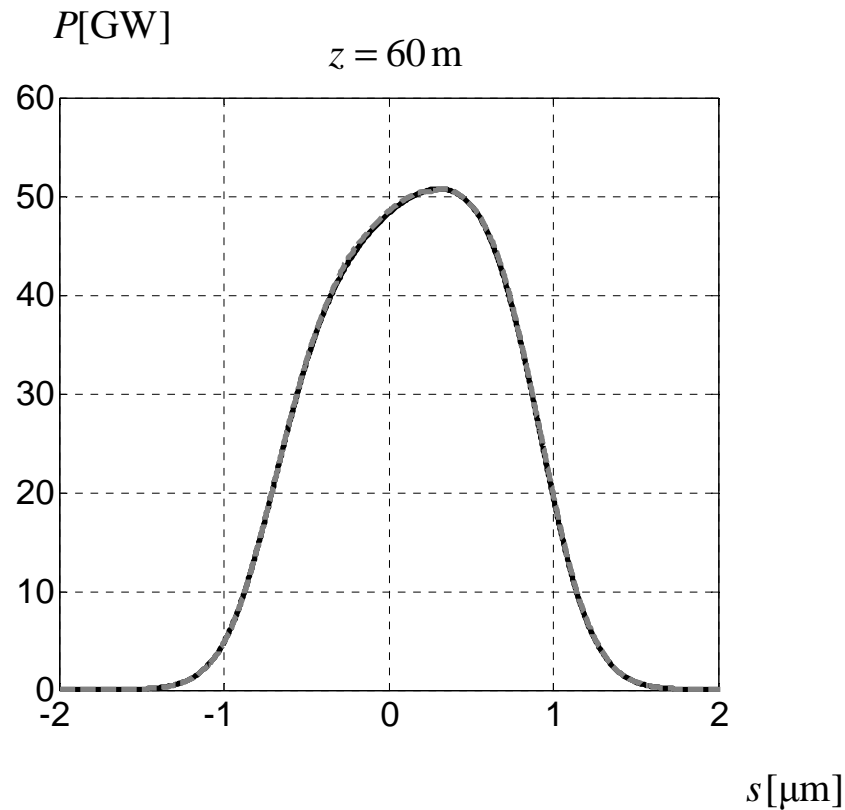
ALICE and Genesis with intersections

Intersections in FEL code

ALICE and Genesis without intersections

Intersections in FEL code

ALICE and Genesis without intersections

Plan (General)

❑ XFEL gun simulations with Gaussian laser profile (Y. Kot ?)

❑ All wakefields in FLASH simulations (I. Zagorodnov)

❑ All wakefields in XFEL simulations (G.Feng ?, H. Jin ?)

❑ XFEL simulations of the whole machine (all)

❑ Modular (fast) tracker in cooperation (I. Agapov) with XFEL GmbH (I.Zagorodnov, M.Dohlus ?)

Plan May 2013

❑ FLASH simulations for low energy spread (lower charge, less energy chirp)

❑ XFEL simulations with Elegant and for the whole machine

❑ Webpage design

❑ ALICE 1.1 (release)

Plan May 2013

❑ FLASH simulations for low energy spread (lower charge, less energy chirp)

❑ XFEL simulations with Elegant and for the whole machine

❑ Webpage design

❑ ALICE 1.1 (release)