Minutes of Introduction to Genesis1.3, v4 on the example of an Echo-Enabled Harmonic Generation based FEL, PITZ Physics Seminar, 10.03.2022

Project: PITZ
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Agenda:

1) Introductions, AOB
2) AOB
   a. Student lab
   b. Conference list, possible invited talk
3) Talk from Fabian Pannek on Introduction to Genesis1.3, v4 on the example of an Echo-Enabled Harmonic Generation based FEL
4) Gun conditioning status

Results:

1) Talk
   a. EEHG principle
   b. FLASH2020+
   c. Genesis overview, lattice file, input file
   d. Genesis output file
   e. Genesis field dump – set a large grid
   f. Genesis beam bump – large files
   g. MK: Not using explicit initial conditions, bunch parameter used for final section?
   h. FP: Beam prepared with modulators and lasers, for the final run is already pre-bunched, no field added.
   i. MK: In the THz range, high bunch charge and low shot noise, how to model the bunch parameter?
   j. EF: Shot noise calculated only for the wavelength. To introduce structures inside the beam. No structures smaller than slice, need PIC code.
   k. PB: FEL in Ocelot compared to Genesis?
   l. GP: Ocelot uses Genesis code, personally used Ocelot for analysis.
   m. PB: Do you use cluster for simulation, how much time and space?
   n. FP: Yes, it takes 2.5h on 240 CPUs, 5-6 GB field file, 40 GB particle size.
   o. MK: Space charge in Genesis?
   p. EF: Longitudinal, but unfinished/in development.
   q. GG: Intensity images in field dump?
   r. FP: Added few months ago in new version of Genesis.

2) Gun conditioning and AOB
   a. GV: Problems with gun at 50 us – gun trip, proposed to continue with 400us
   b. HQ: Try to reduce the peak power to 7.5 MW? The threshold is different.
   c. TW: Cancel next week Tuesday-Friday morning shift for work in second tunnel.
   d. GV: Will shutdown machine and open tunnel.
   e. FS: How many BPMs for flash radiation beamline? Four and spares?
   f. XL: 35mm beam tube is OK

Protocol prepared by
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