

Simulation

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WEIZMANN
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Followups from last time #1

◎ **Isahy**

- ◎ Sasha needs a sign-off for the geometry that he has put in the simulation
- ◎ do you consider the existing design of the IP chamber to be final?
- ◎ there were some discussions about vertical approach - do you have some updates on that?
- ◎ Vertical approach looks like the right way to go
- ◎ We will need to inspect the current model Louis prepared and make a decision. In any case, the impact on the optical layout inside the chamber may be very small - just a rotation of the first and last mirror in 90 deg., so it is likely that this decision will have negligible impact on Sasha's simulation
- ◎ As for the rest of the layout, cannot think of further element we need to include.
- ◎ Need to make a final decision about the laser-electron AOI, which in our drawings is 15°

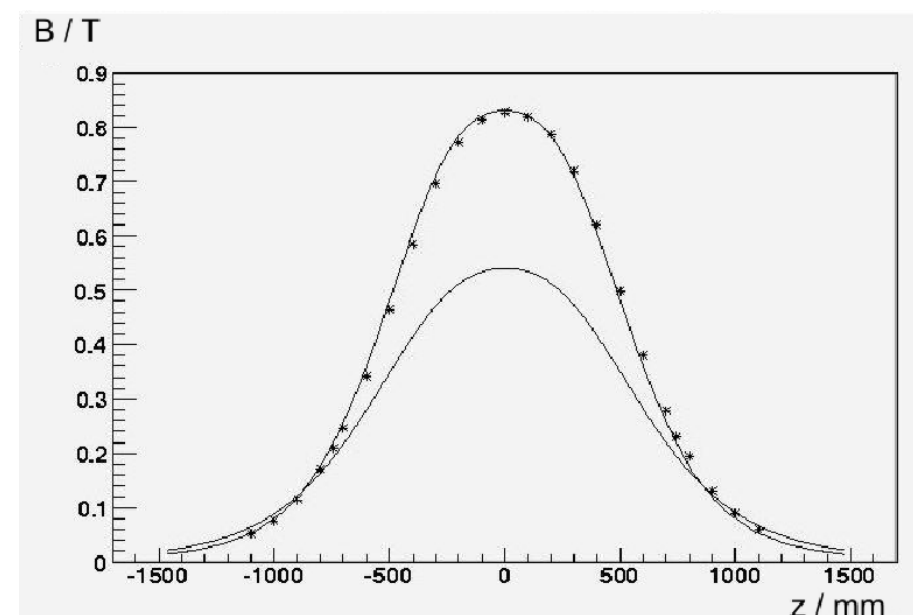
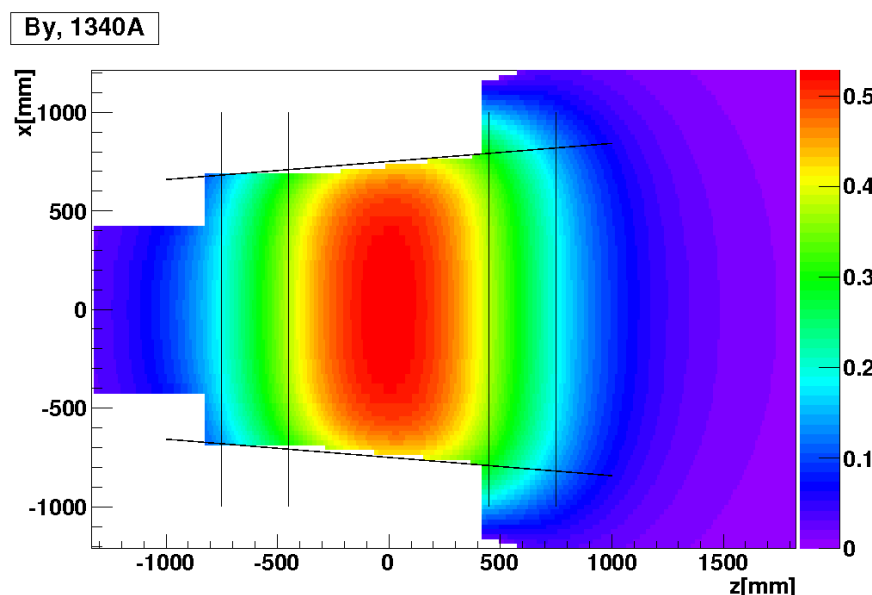
Followups from last time #2

- ◉ Louis (relevant things for Sasha)
 - ◉ ask around (Ingrid G.?) if we can dig the in-situ measurement of the B-field map
 - ◉ we need to find out what is the XFEL vacuum requirement
 - ◉ we need to find out what is the material of the XFEL beampipe (not stainless steel probably, but anyhow this is our responsibility)
 - ◉ we need to find out what is the typical noise level that of the beam itself
- ◉ Sasha:
 - ◉ besides implementing all “major” items from the newest drawings,
 - ◉ when implementing the vacuum chamber, please use 200 um of Kapton as the windows facing the detector. We know this is possible from Astra-Gemini (Gianluca will dig the drawings)
 - ◉ Upstream beam monitors:
 - ◉ Cherenkov: probably use the same mechanics as for the IP design
 - ◉ Scintillator: use AWAKE’s drawings?
 - ◉ Fwd spectrometer: see discussion today
 - ◉ should target launching large scale submission by the end of this week for testing the simulation integrity at least. Then, when everything is implemented we go for full scale submission

Followups from last time #3

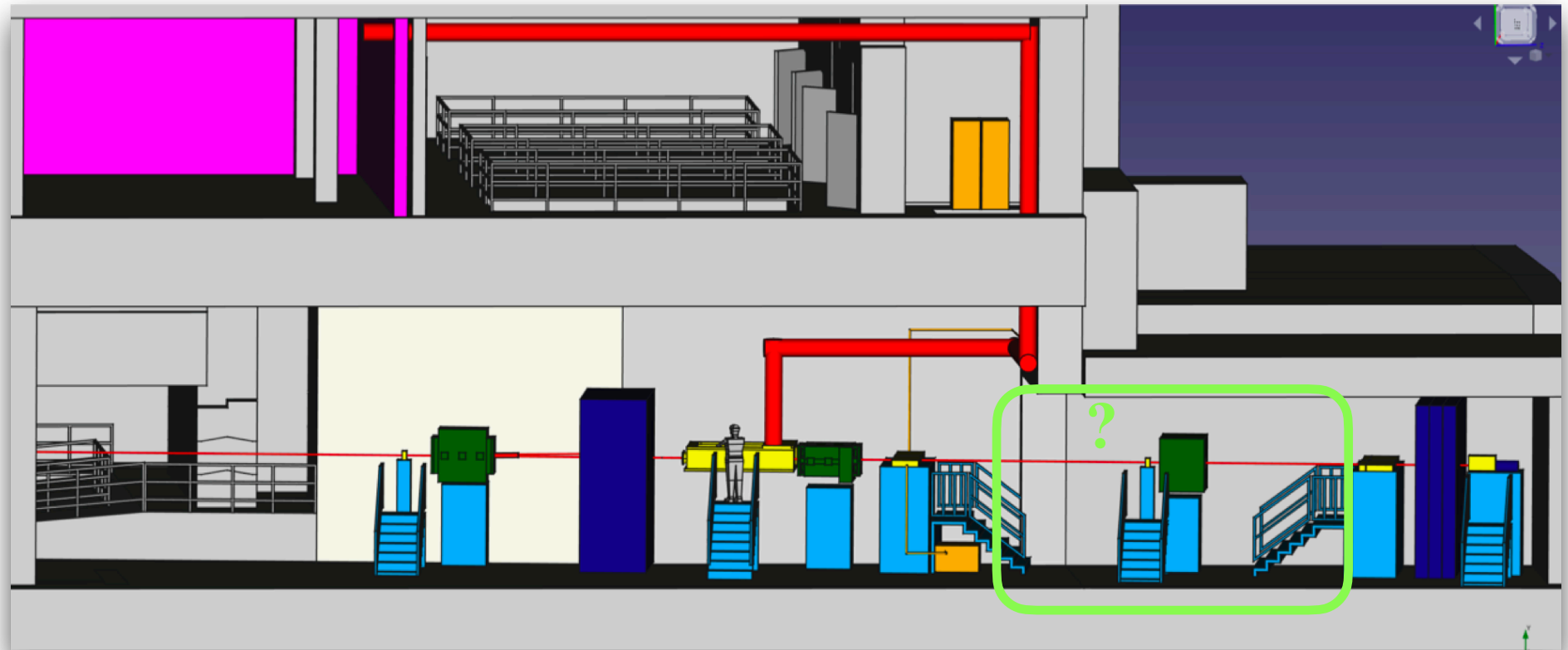
- Everyone:

- we need to take a decision pretty soon about the B-field value (I can run a systematic study after I have Tony's signal at 16.5 GeV)
- if we cannot find the measured map from the past, we need to come up with a realistic effective B-field map ("clipped" Gaussian volume)
 - The DESY II test beam facility ([NIM. A. 922 \(2019\) 265-286](#))
 - Test beam facilities at CERN and DESY ([LCWS 2008 Chicago](#))
 - MAGNETIC MEASUREMENTS AND SIMULATIONS FOR A 4-MAGNET DIPOLE CHICANE FOR THE ILC ([SLAC-PUB-13046](#))
 - BGO-OD Experiment (pictures below, not our dipole but still...)
- Please fill the parameter book, it is linked here - please have a look at start filling in detail, according to the existing examples



Fwd spectrometer related issues

- ◉ How to end the beam pipe and what converter target to use
 - ◉ 1 μm wire in vacuum is not possible also 10 μm foil
 - ◉ the target could be just a 200 μm thick Kapton, just like what we plan to do at the end of the IP vacuum chamber. Kyle and Gianluca are investigating in FLUKA
 - ◉ whatever we do here will ultimately determine the rate...
- ◉ Louis what is the reason for the large spaces after the IP?



- ◉ Technologies:
 - ◉ **Spectrometer:**
 - ◉ traditional pixel tracker looks not suitable probably due to the high rate
 - ◉ Kyle and Gianluca are investigating scintillator crystals of size $\sim 0.5 \times 2 \text{ mm}^2$ in x:y segmented to create a grid of $\sim 30 \text{ cm} \times 10 \text{ cm}$ in x:y
 - ◉ **Profiler:** we didn't discuss materials etc
 - ◉ **Calorimeter** (backscattering): need a conceptual design