Thoughts on different topics

Louis Helary - DESY

Went to Jena to discuss with Matt and Alex and see the Jeti40 laser.

Matt is actually proposing to have 3 data-taking modes:

1) e- + laser
2) Gamma (from target) + laser
3) Gamma (from compton created at the target) + laser

First two running modes, are nothing new. Although Matt was skeptical about using Compton electrons for gamma (from target)+laser setup, as he thought that it would be too tedious to really make the fine synchronization that way.
    → Do we need the motorization of tracker+cherenkov at all? Have to discuss it on Monday.

For Option 3), it's actually something new that we did not considered so far, and has some slight implication on the setup:

1406.1832

Quasi-monoenergetic femtosecond photon sources from Thomson

Scattering using laser plasma accelerators and plasma channels

→ Matt think that we can create ~10 GeV photon beam that way, with quasi-monochromatic properties and very narrow angular distribution, with occupancy of ~10^6 photons.

→ Main implication on the setup:
  → Add vacuum chamber to bring up or down the target.
  → Add smaller size laser split beam to the target
  → Can we focus the beam to the target to increase the number of interactions?
    → Might need an extra-permanent quadripole?
  → Can measure electrons resulting from the compton with Cherenkov and scintillating screen after dipole.
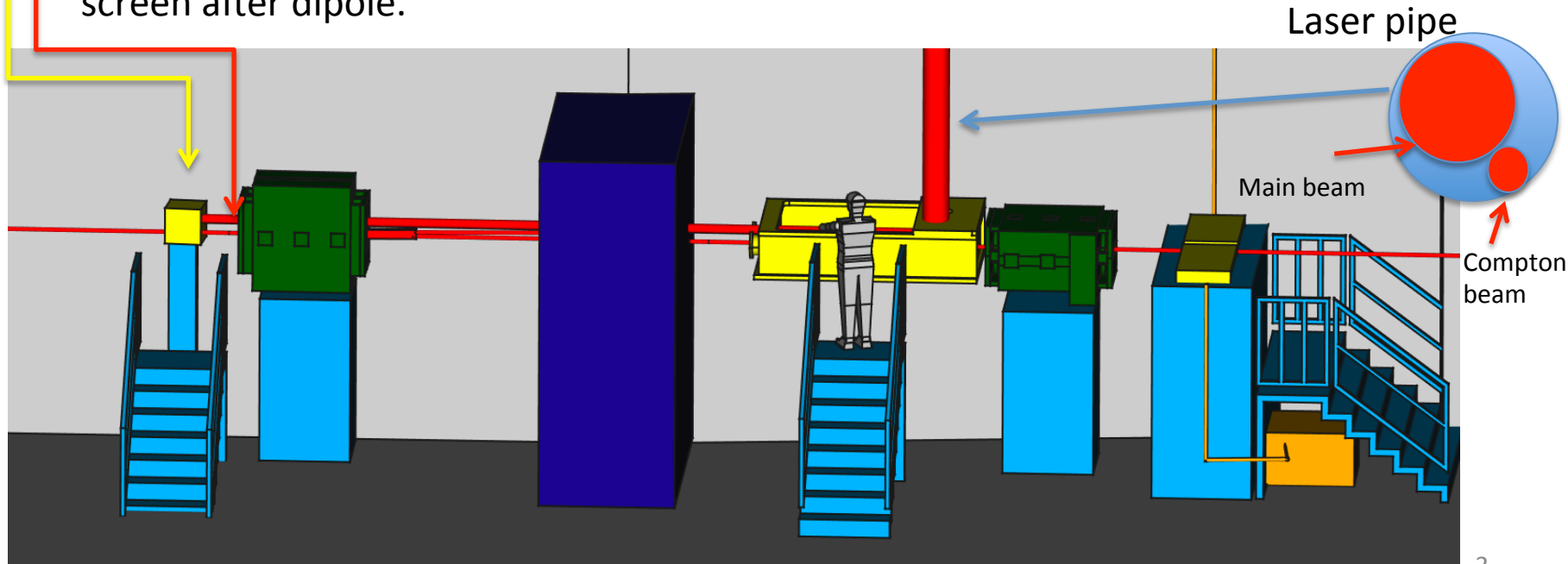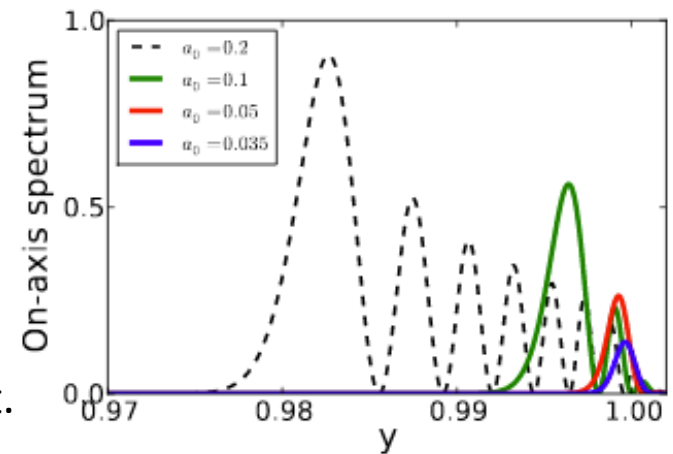
Size of the Shielding and pricing.

Dimensions of shielding near photon dump :
500cm*340cm*30cm of Iron
500cm*340cm*60cm of Al

Dimensions of shielding near electron dump:
310cm*340cm*150cm of Iron

Al mass volumic is   2.699 g cm-3
Iron mass volumic is   7.87   g cm-3
https://pdg.lbl.gov/2010/AtomicNuclearProperties/HTML_PAGES/026.html
https://pdg.lbl.gov/2020/AtomicNuclearProperties/HTML/aluminum_Al.html

Metal price from google:
Iron Prices, Kilogram 1.38 USD (Second check find prices from 0.2 USD/kg so I'm a bit confused...)
Aluminium Price Per 1 Kilogram, 1.79 USD (Most of the price found are on this ball park).

Total:
$(500*340*30+310*340*150)*7.87/1000.*1.38+$
$500*340*60*2.699/1000.*1.79=276k$ dollars.
$(500*340*30+310*340*150)*7.87/1000.*0.2+$
$500*340*60*2.699/1000.*1.79=82k$ dollars.

Can probably survive with a core of concrete and
just add metals in the center?