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- correction is done based on the energy deposited in the presampler:

$$E_{\text{upstream}} = f(E_{\text{presampler}})$$

Simulation details

- 50k events
- 100 GeV electrons
- 1.5 X_0 in front for $\eta = 0$

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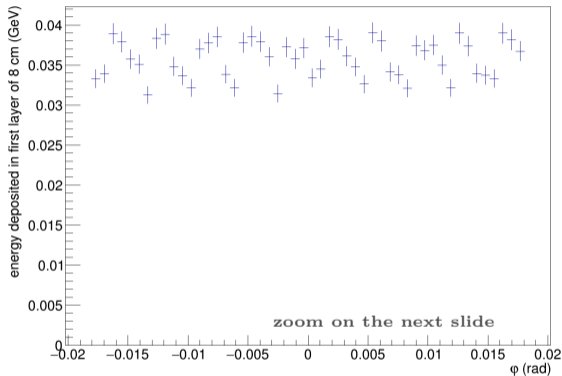
- 50k events
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- 1.5 X_0 in front for $\eta = 0$
 - but: without tracker (easier to implement)
 - 0.35 X_0 of tracker simulated by addition of 3cm Al ($3\text{cm}/8.9\text{cm}/X_0 = 0.034 X_0$) instead of our 3cm air gap
 - need to communicate with tracker developer (Valentin) to be able to use it \rightarrow is it necessary now? will it be later?

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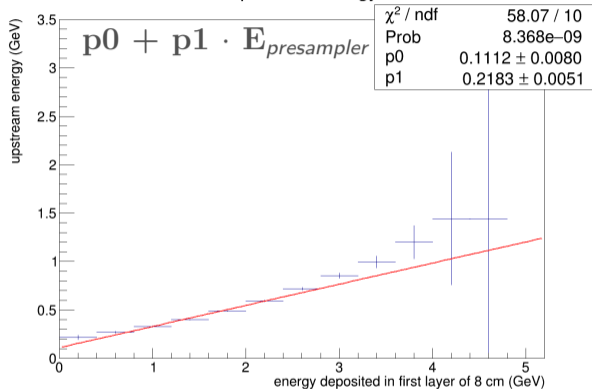
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- energy upstream = sum of energy deposited in cryostat and in lAr before calorimeter (so in 1.5 X_0 for $\eta = 0$)
- energy in first layer (“presampler”) = energy in first layer of calorimeter

1.5 X_0 in front, presampler" 8cm thick

Energy deposited in first layer of 8 cm

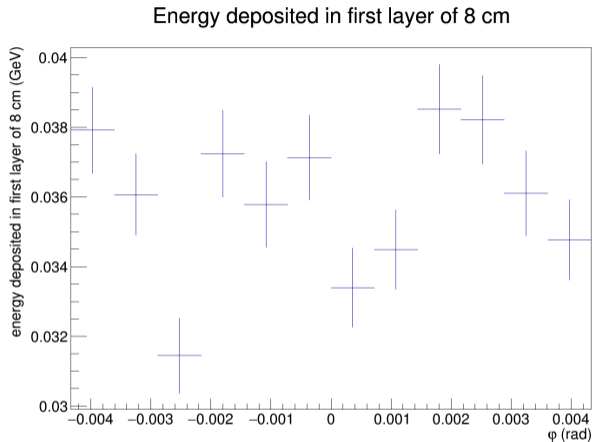


Upstream energy



- 65 cm calorimeter
- 8 same-length layers: 8.125 cm each

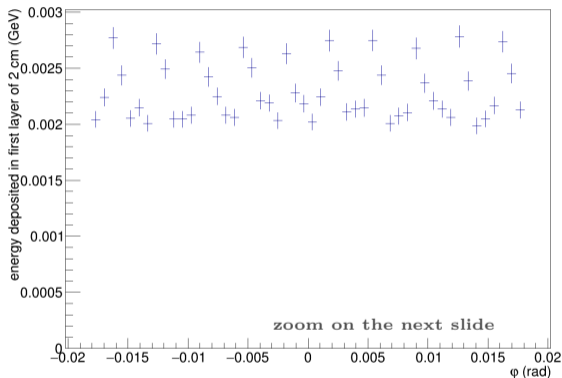
φ distribution



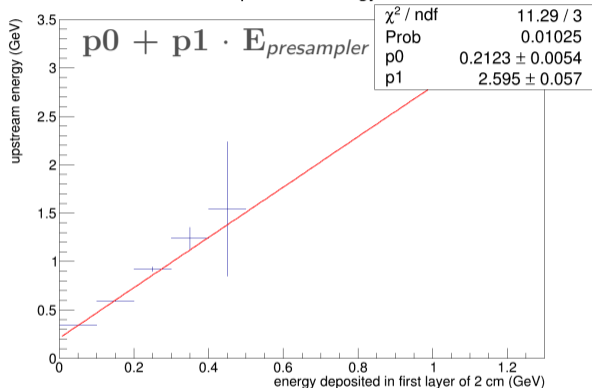
- number of absorber plates: 1741
- distance between absorber plates: 0.00360895 rad

1.5 X_0 in front, presampler" 2cm thick

Energy deposited in first layer of 2 cm



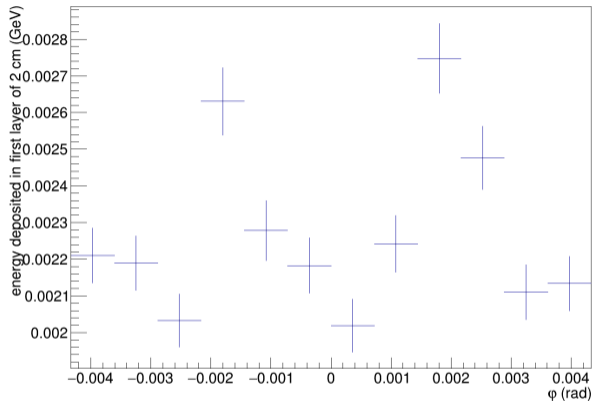
Upstream energy



- 4 times smaller layers: 2.03125 cm

φ distribution

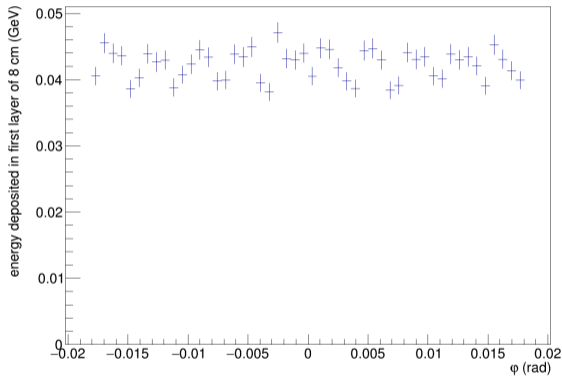
Energy deposited in first layer of 2 cm



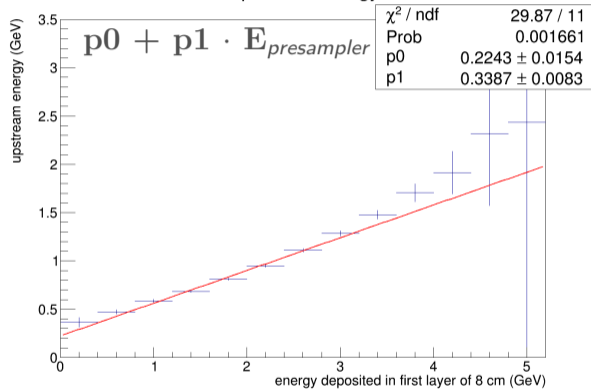
- number of absorber plates: 1741
- distance between absorber plates: 0.00360895 rad

with B field 4 T, presampler" 8cm thick

Energy deposited in first layer of 8 cm

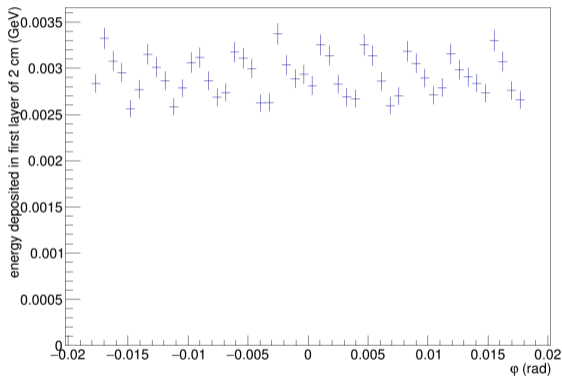


Upstream energy

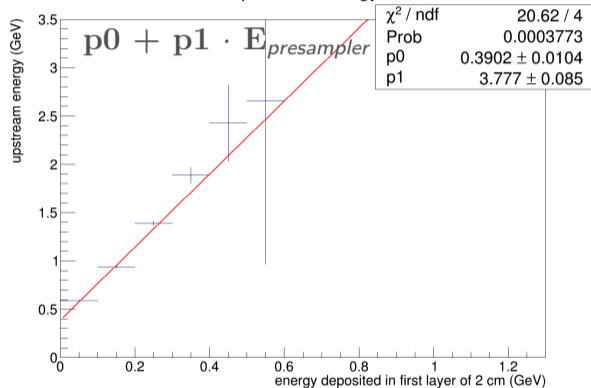


with B field 4 T, presampler" 2cm thick

Energy deposited in first layer of 2 cm



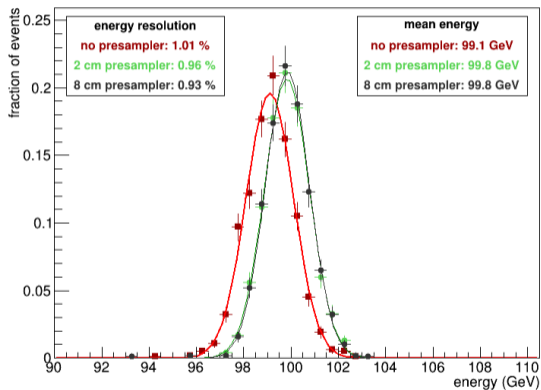
Upstream energy



Correction to the energy

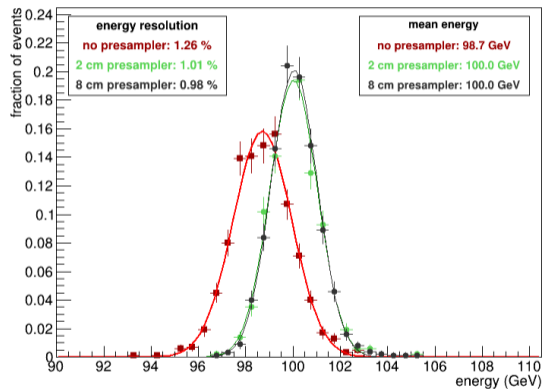
no B field

Energy distribution for 100GeV electron



$B = 4 \text{ T}$

Energy distribution for 100GeV electron



Next steps

- check upstream energy for more initial particle energies (running currently)
- correct for few initial particle energies to get energy resolution as a function of energy
- to get rid of strong φ dependency one could eliminate lead from first few cm of absorber