

# Geant4 simulation of LumiCal TB

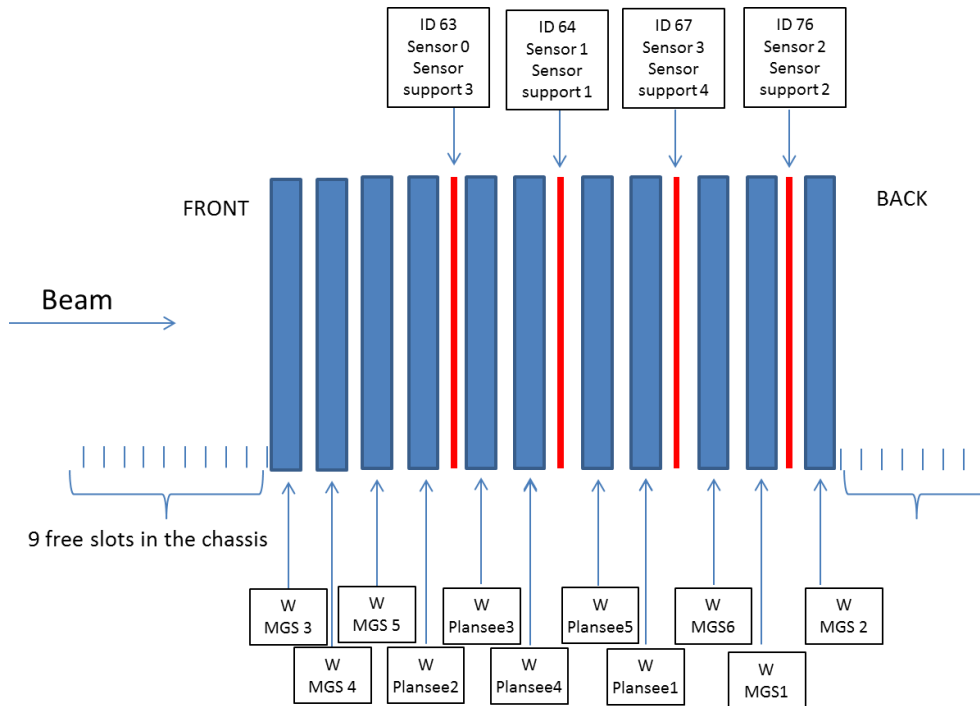
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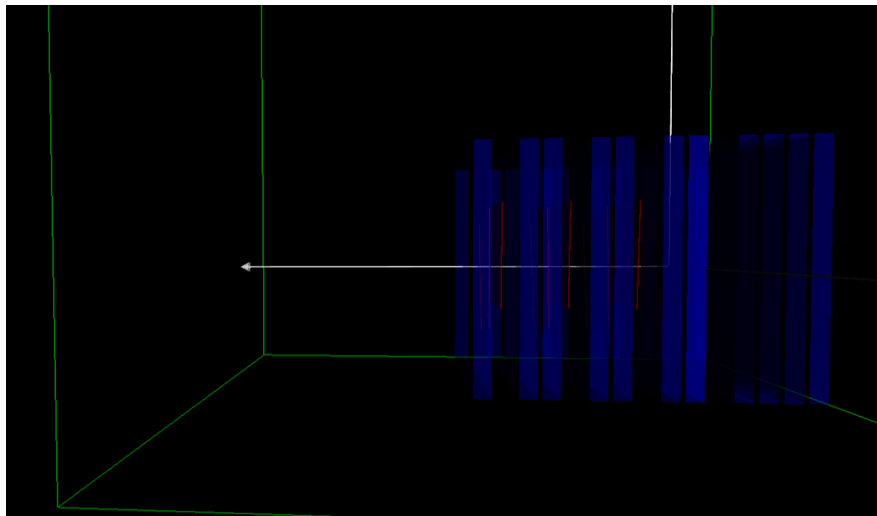
# Overview

- Implementation of TB LumiCal geometry in Geant4
- Muon energy deposition in Si sensor
- EM shower energy deposition in LumiCal
- Longitudinal EM shower development
- Conclusions

# LumiCal TB geometry in Geant4



- geometrical dimensions were taken from Francois Nuiry's presentation
- pure tungsten
- Si sensors of 320  $\mu\text{m}$

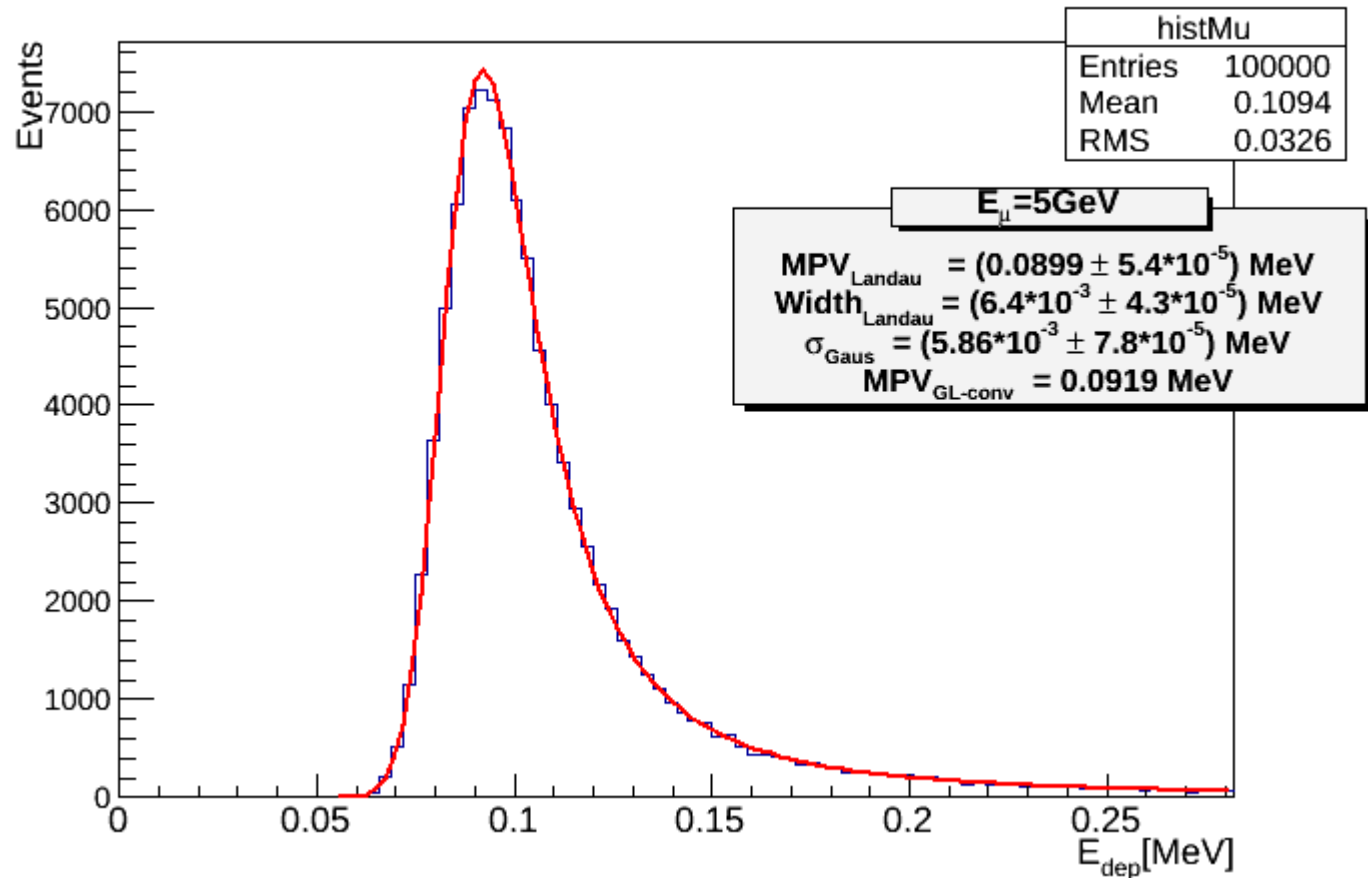


- *Geant4 geometry for third configuration*

## Muon energy deposition in Si sensor

### Geant4 Simulation conditions

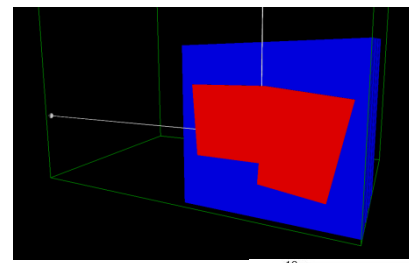
- Si with 0.320 mm thickness
- $E_\mu = 5 \text{ GeV}$
- PAI Physics List



# EM shower energy deposition in LumiCal

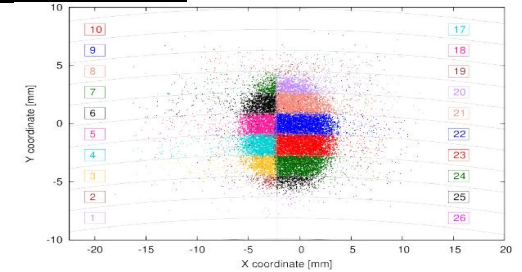
## Geant4 simulation conditions

- e- beam of 5 GeV
- Sensor geometry in the upper picture
- beam profile is a disk with
  - $r \cong 5\text{mm}$
  - centre of disk is about the same as in experiment
  - uniform e- position distribution inside the disk
- Phys. List: PAI for sensors and EM standard for tungsten

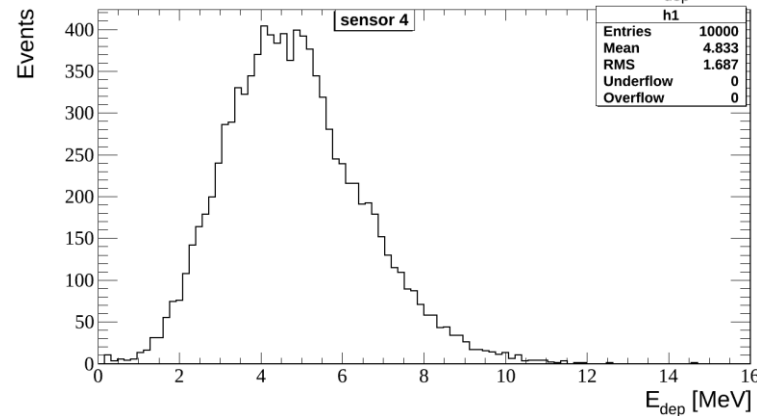
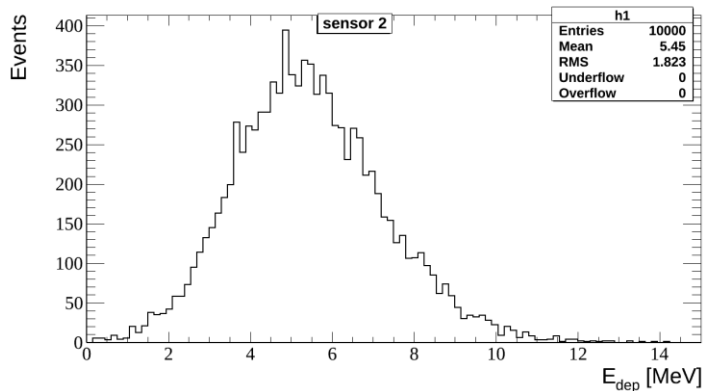
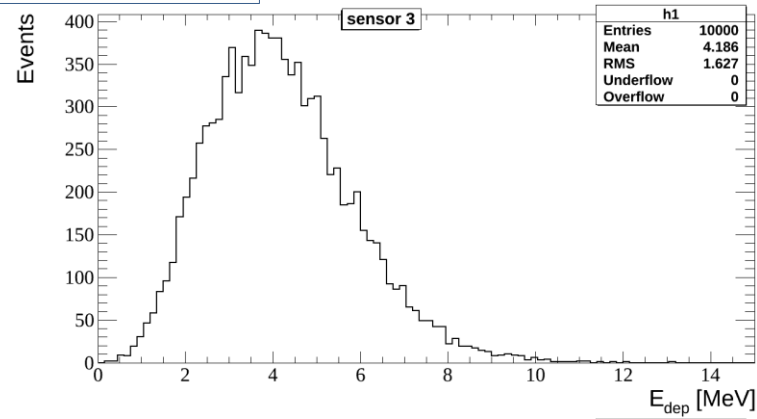
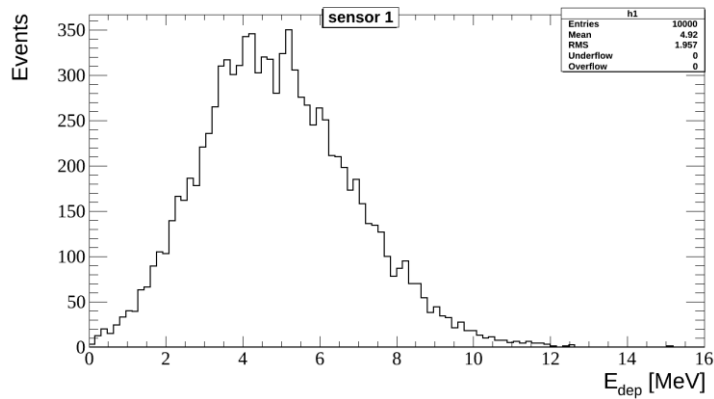


GEANT4

From Jakob



## Example of the energy deposition for third configuration

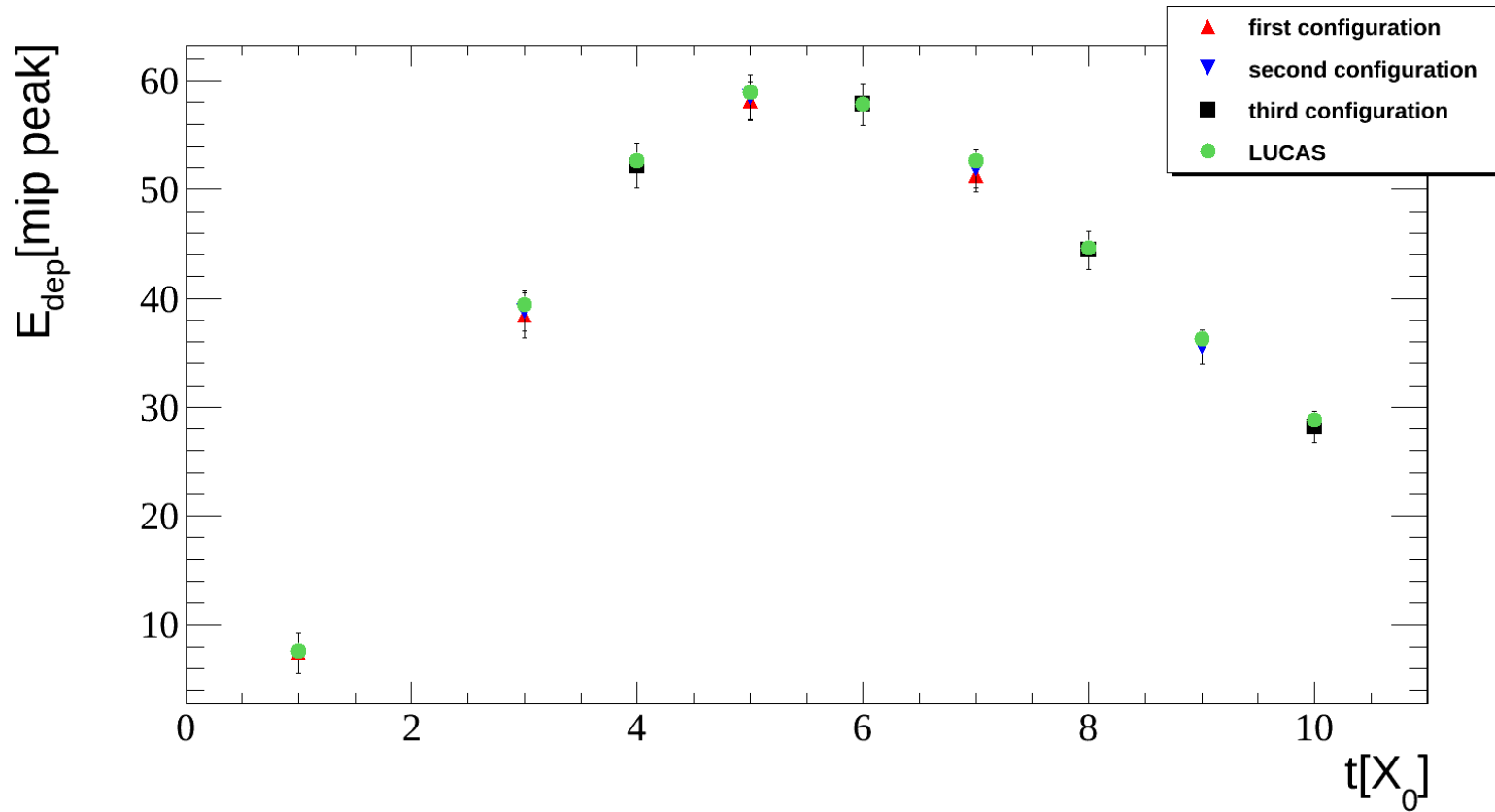


# Longitudinal EM shower development

- Mean energies were taken from energy deposition histograms

Energy deposited is given in the muon energy deposition (MPV) units

Lucas simulation values were taken from precedent presentations



## Conclusion

- Geant4 simulation was done for 2014 LumiCal TB taking into account the spread of the beam , about the same sensor dimensions equipped with electronics
- PAI model was used for silicon sensors and standard electromagnetic model for tungsten absorber
- Very good agreements with LUCAS simulations

## ACKNOWLEDGEMENT

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