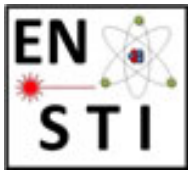

Energy Deposition Results in: Decay Tube Window & Shutter

1st AWAKE Performance Meeting
28.10.2013
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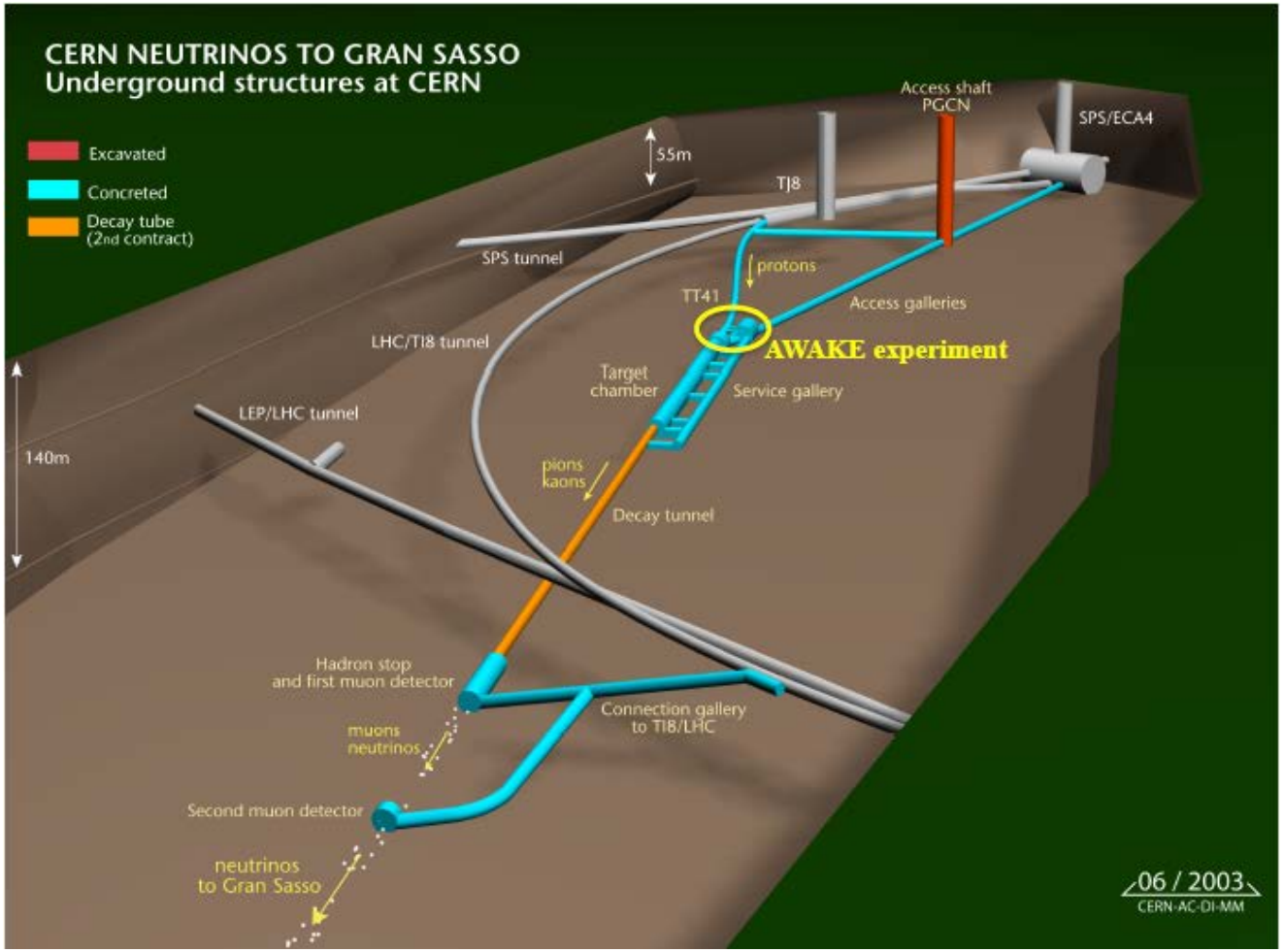
Introduction



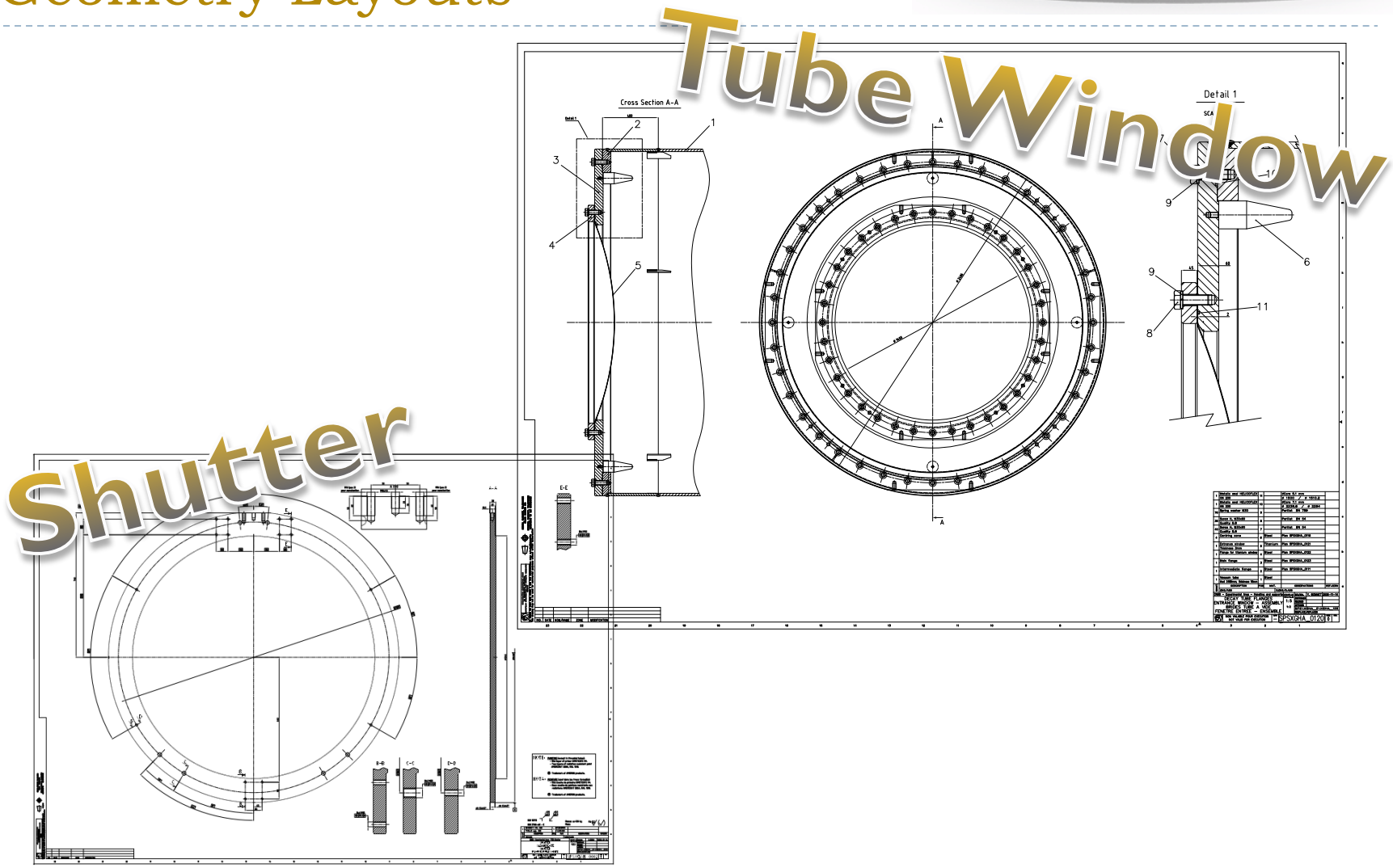
Simulation Setup
Beam & Materials

- Beam Parameters
  - Energy : 400 GeV
  - Intensity : $3.5*10^{11}$ p^+ (Ultimate: $3.5\ 10^{11}$)
  - 1 sigma : 6mm at the window
  - Frequency: 0.14Hz
  - Center of beam is at center of window
  - Divergence → 30urad

- Materials
  - Tube Window: Titanium Grade 2
  - Shutter: Iron

Simulation Setup

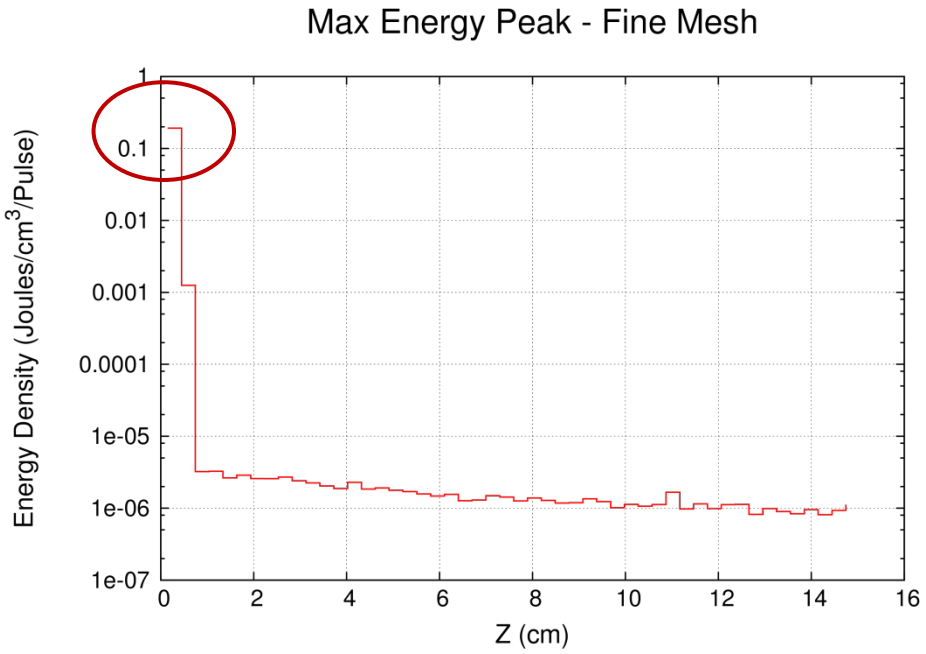
Geometry Layouts

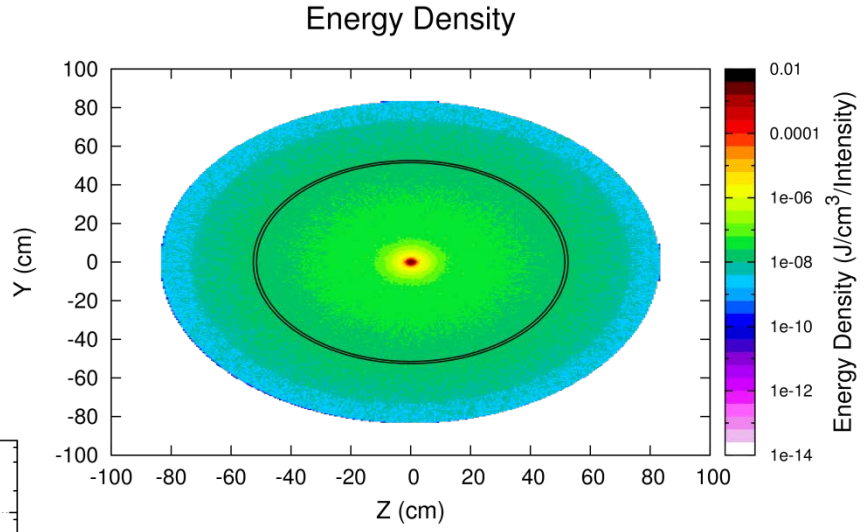


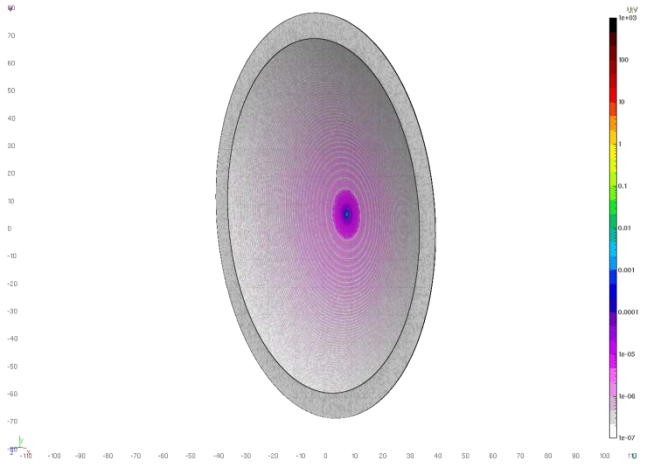
FLUKA: Energy Deposition Calculations

Decay Tube Window

- Max Energy Deposited:
  ~ 0.2 Joules/cm^3/Pulse



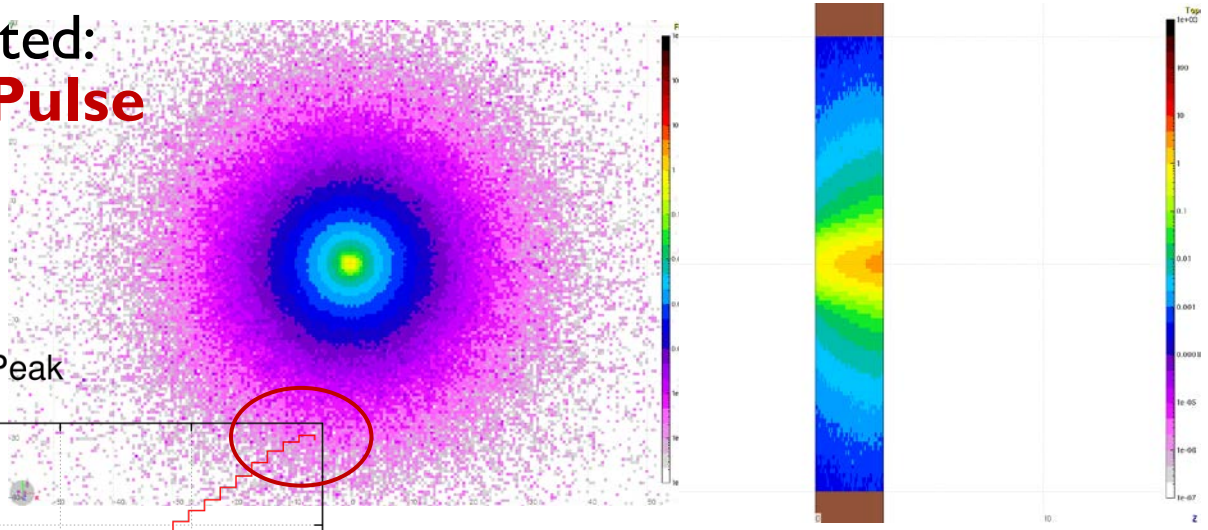


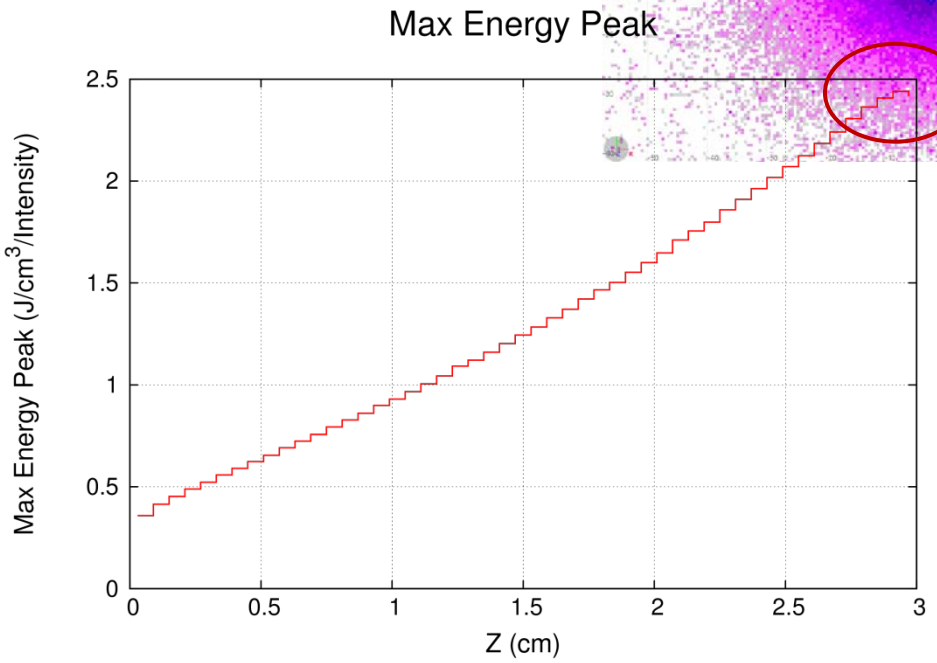


FLUKA: Energy Deposition Calculations

Shutter

- Max Energy Deposited:
  ~ 2.5 Joules/cm³/Pulse





Summary

- Maximum Energy Deposited:
  - ~ 0.2 Joules/cm^3/Pulse on Window
  - ~ 2.5 Joules/cm^3/Pulse on Shutter

- Both presented simulations are accepted.

- Questions ??

Backup Slides

- Material Definition:
  - TG2:

Material	Mass Fraction %
Carbon	0.1
Iron	0.3
Hydrogen	0.015
Nitrogen	0.03
Oxygen	0.25
Titanium	99.2