AIDA wp 8.2.2 – LYSO Beam Radiation Monitor

Erik van der Kraaij - University of Bergen
on behalf of UiB & INFN,
Claudia Cecchi & Gerald Eigen

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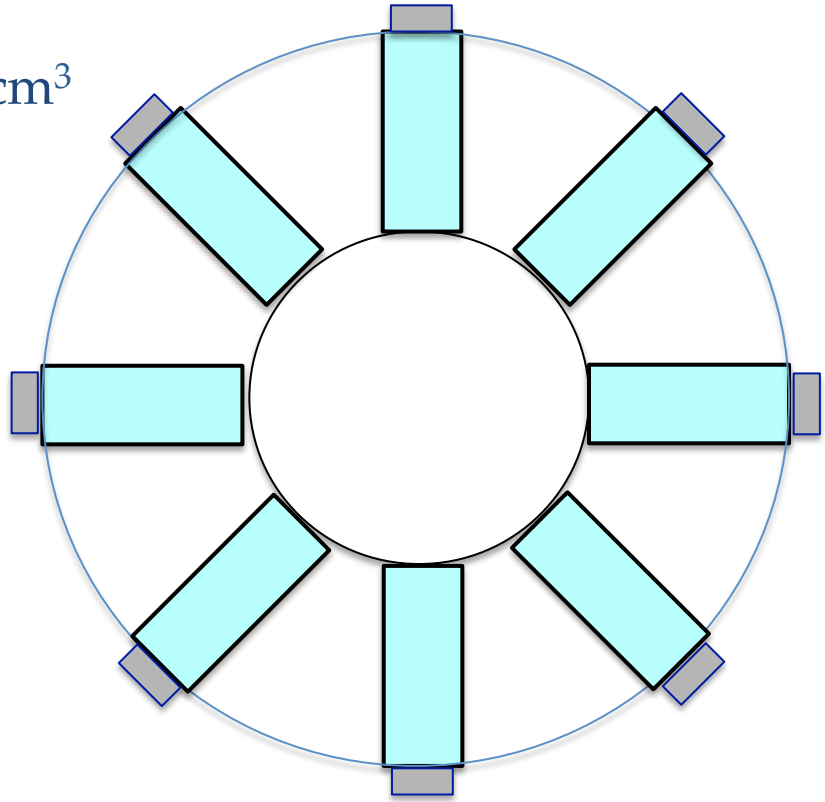
Introduction

- The original task, the work on the LYSO calorimeter prototype, was completed before the AIDA network started
- This gives the opportunity to work on a somewhat different project for AIDA task 8.2.2
  - Claudia Cecchi: a beam radiation monitor that detects photons in the 100 keV to 500 keV energy range
- Since small LYSO crystals should be sufficient for this task, the following is a possible design

First design

- Arrange array of 8 LYSO crystals around the beam

- Crystal sizes are blocks of ~0.5x0.5x2 cm^3
  - crystal faces are polished
  - uniform response
- Maybe use projective geometry
  - response is not uniform
  - need surface treatment



- Read out each crystal with SiPM (KETEK, Hamamatsu 3x3 mm^2)

- Place a mirror at the end opposite to the SiPM
- Wrap crystal in white diffuse reflector (Teflon, Tyvek)

Summary / conclusion

- Need to decide on crystal shapes and dimensions
- Order crystals and SiPMs
- Come up with a mechanical support structure
- Build the detector and test it with a photon source (^{137}Cs, ^{22}Na)
- Aim for late fall since we have two other tasks in WP9
  - Due to organizational problems in Norway, we started late