Mokka and LumiCal

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DESY- HH
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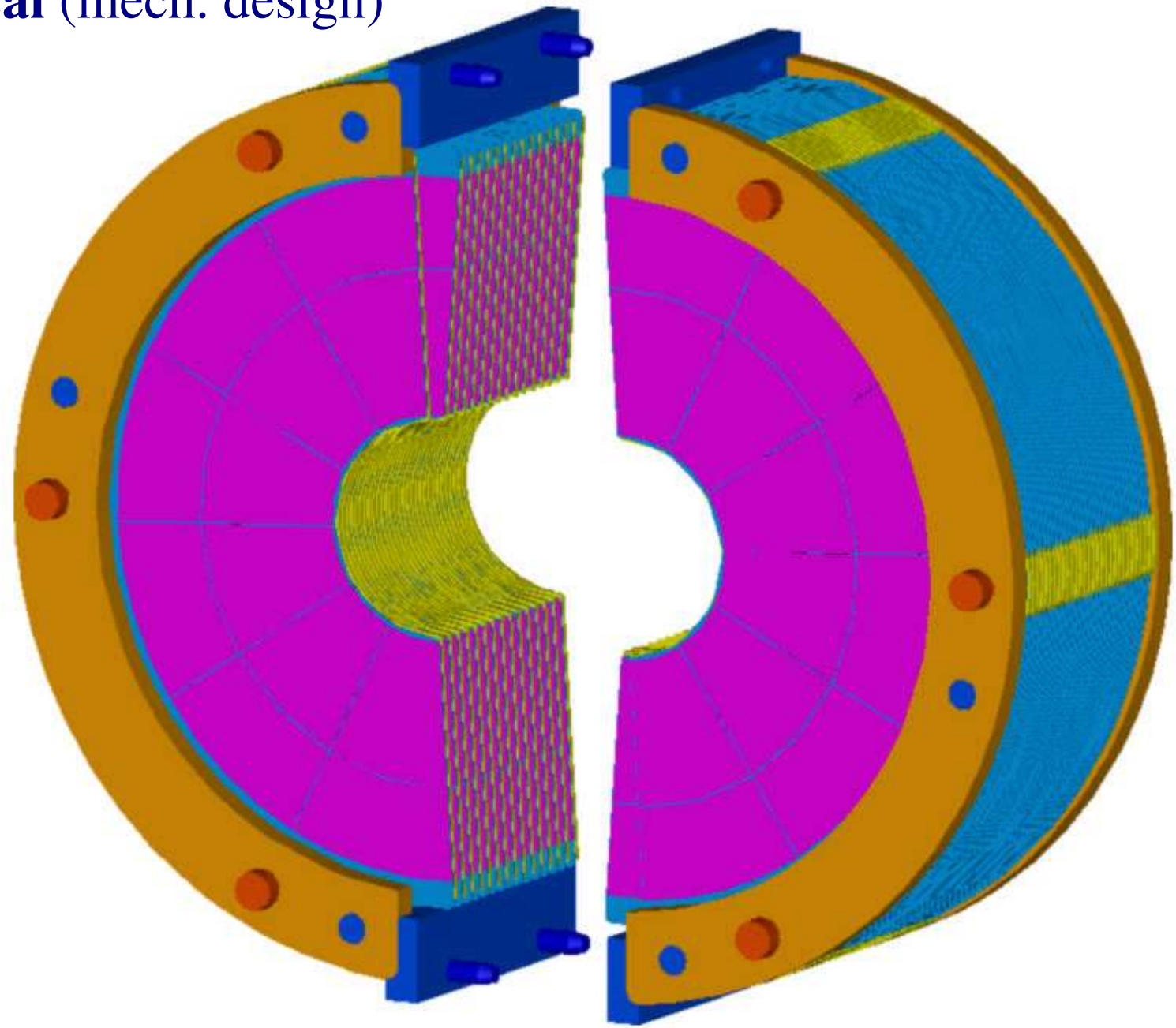
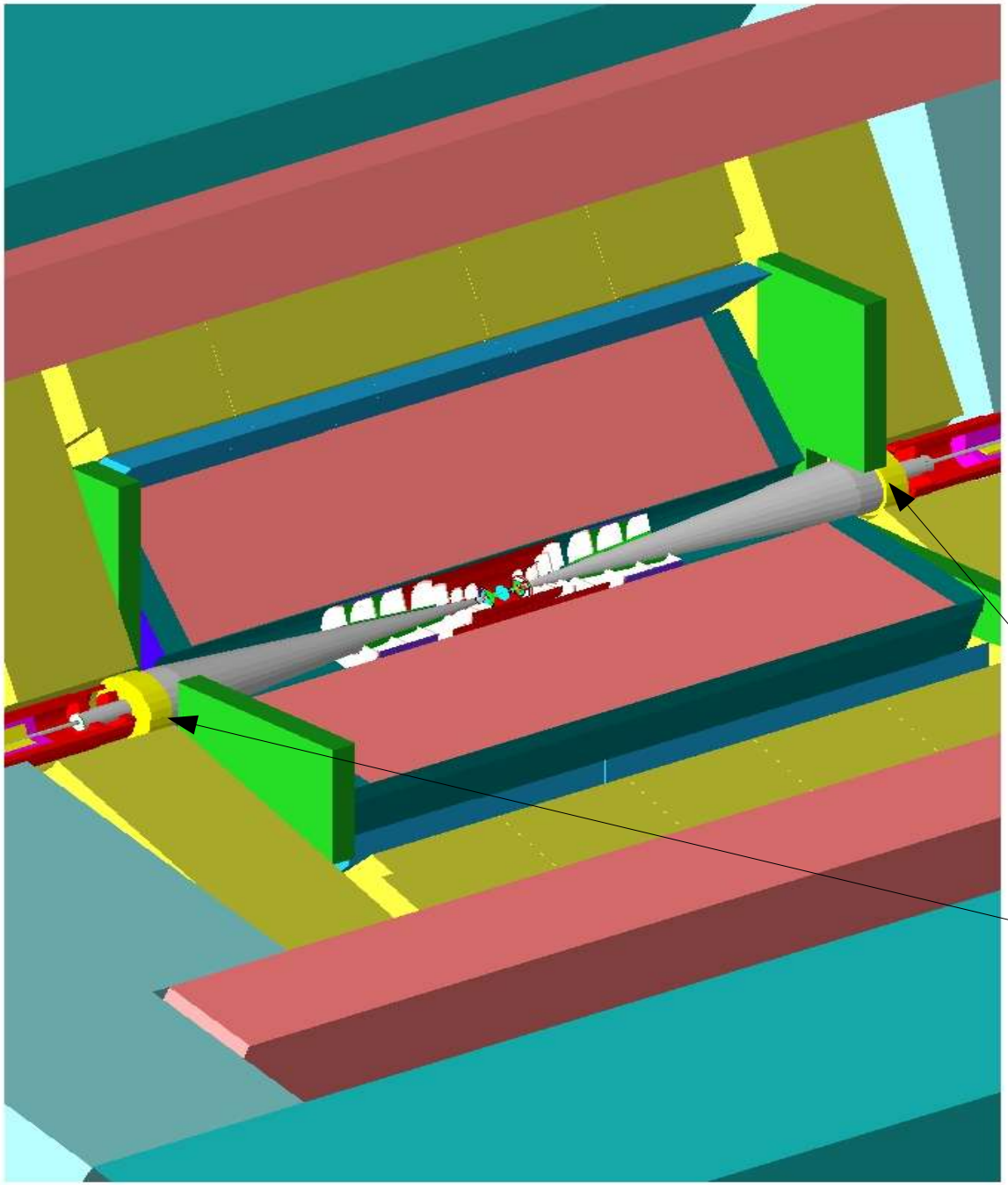
LumiCal description

- LumiCal consists of 30 tungsten disks, thickness 1X0 each (0.35 cm)
- Inner /outer radius of disk is respectively 8 cm/28cm
- Each disk has attached silicon strip detector (0.05 cm)
- For “strip” design every second detector has either 120 radial strips to measure azimuthal angle φ or 64 concentric strips for measurement polar angle θ
- For “pad” design each silicon detector is divided into 15 rings and 24 sectors

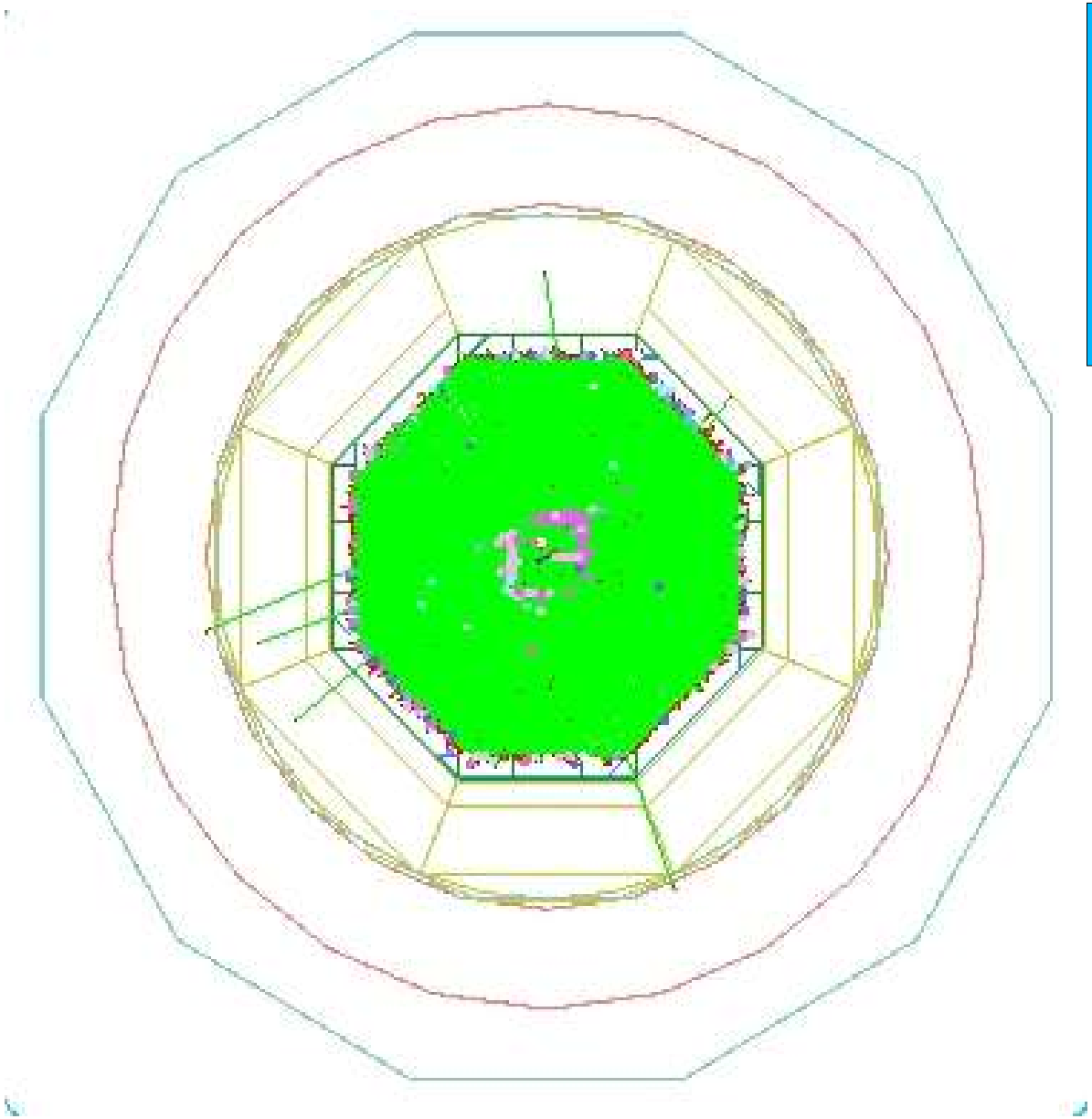
LumiCal (mech. design)





Tesla Detector

LumiCal



Bhabha event at 500 GeV

$e+e-\rightarrow e+e-\gamma$

- ***Initial version for both designs are in the Mokka frame***

- ***Need to start simulation***
- ***Compare results with these obtained with Geant3***

but :

simulation of one Bhabha event takes ca, 20 sec with Geant3 and ca. 15 min. with Mokka !

Possible Solution:

- introduce concept of production cuts per region (present in G4)

First attempt (done!)

- ***New method*** CGAGeometryManager::RegisterGeometryRegion

- ***Any geometry driver may create his*** G4Region
  and register to Mokka ***with specific production cut***

- ***In*** Mokka PhysicsList::SetCuts() ***piece of code to go through***
  list of registered regions setting specific for each one cut

Result:

small improvement ca. 30% faster

still too slow

Ongoing activities :

- Developing software to implement LumiCal into Marlin frame (analysis, reconstruction, digitization)
- Digitization module for LumiCal
- More realistic LumiCal model (support, possible displacements and distortions)