30/06/2008

ILD action list :

1. Magnet

- Prepare a list of questions to submit to F.Kircher during a meeting (+ videoconf with Japan)
- Real impact of the gaps
- I s it possible to cycle the field up and down to reduce remanent magnetization of the iron in order to reduce the gap necessary to separate the endcaps from barrel yoke. How long compare to a normal shut down ?
- Stray field :
  - Simulate the effect on the stray field of external iron around the gaps (not in touch with the barrel)
  - minimal thickness and radius for stray field constraints in z and R
  - 3D simulation of the stray field in particular, and study the possible impact of square holes on the field and effect on the beam.
  - Influence of the repartition of muons chambers in all thickness, or first half.
- Permeability curves, to be sent around.
- ✓ (From Sendai summary) :TPC field uniformity , question of anti DID. In case of a L* of 7 m, so crossing angle of less than 10 mrad, is the antiDID still useful ?
- ✓ Coil :
  - Mechanical deformation when loaded with calorimeters (less than 4-5mm), i.e. thickness of SS
  - Dimensioning for 4T, (even if work to 3.5 T) with 4 layers of windings (CMS like)
  - correction currents to control TPC homogeneity versus antiDID . Does it have an impact on stray field?

- ✓ +Magnet :
  - How to insure rigidity between the 3 rings of the yoke during push-pull (additional outer structure ?)
  - Thickness of the first layer of the yoke on the viewpoint from magnetic field and mechanical deformation.
  - Presence of gaps against self shielding. To be checked.

2. Beam pipe

- See with Fcal people how small the lumical outer radius can be.
- Impact on forward detectors, thickness of the cone.
- Mechanical strength studies
- How long can the Be part be ?
- Shape of the first angle at 10cm
- Beam pipe radius/first layer of the vertex
- Pumping solutions

3. 8 versus 12 fold; Calorimeters

- φ symmetry for Calorimeters, compare constant and varying sampling simulations.
- Simulation and incidence on the HCal PFA performance
- Prepare a document to summarize the advantages/disadvantages of each version.
- From FJPPL08's summary :

a) <u>For Ecal</u>:
   - going from 8 to 12 fold symmetry increases the distorted area from 20 to 50 % (depending on the radius)
   - the ratio of surface devoted to DIF versus Surface of detection changes in the same way.
   - Study the DIF board and cooling in the 12 fold solution.

b) Hcal :
   - Obviously, a geometry closest to a cylindrical shape is the better case.
   - The actual AHcal structure of the barrel is 8X2 fold and has a dead zone but, as presented by K. Kschioneck, staggered spacers might be considered.
   - A 12 fold symmetry cannot be used in case of a design " a la Videau " as in Ecal, because of the resulting limitation in numbers of layers , and a much more delicate mechanical structure

c) Along the beam direction:
   - The main difference between the two solutions is mostly in the structuring in Z : AHcal in 2 rings, and in staves of 5 modules for 2nd version.
   - Case one has the advantage of electronic connections directly accessible in the gap between Barrel and endcaps. While in 2nd solution, the electronic exits will be inside the coil and all the cables will go between this space. Thus, electronic won't be accessible at all during an "on beam position " opening, but then there will be less empty zone.

d) <u>For Hcal structure</u>, it should be noted, that even if SS is still considered as a baseline material, some points are still to be verified as its magnetic reminiscence , the saturation or not at 4 T, and above all, the evolution at welding points.

4. muon chambers

We need 10 λ between IP and the last muon chamber.

One muon chamber between coil and yoke, the last one outside the yoke. About 7 inside the Yoke.

5. Forward region :
   How to support those detectors, their services, shielding.

From Sendai summary : Two solutions for this support structure are pursued and will be compared:
- ●a cylinder supported from the floor outside of the detector, studied at KEK (H. Yamaoka)
- ●a square structure (about 70cm x 70 cm) supported from the floor and the end caps studied at LAL (M. Jore)

6. TPC :
   - Inner radius (see optimization group)
   - Field homogeneity

7. Inner detectors :
   Relevant to LPNHE, and/or Korean group (Prof. Hwanbae Park)