On the coil

Meeting yesterday with F. Kircher, O. Delferrière, Ch. Bourgeois, A. Gonnin, C. Clerc, H. Videau

What we know about the coil,
what we should know and when
what is still to investigate.

Dates:
DBD end 2012
cost estimate by March 2012

	Specification	ILD **with** correction coil, **without** anti DID				ILD **without** correction coil, **with** anti DID		Remark
Fringing field		3.5 T, 2D	3.5T, 3D	4T, 2D	4T, 3D	3.58T, 3D	4T, 3D	
Radial direction (R = 15 m from IP, z = 0)	Less than 50 G	34 G	50 G @ 13.2 m	120 G	50 G @ 13.7 m	50 G @ x = 15 m 50 G @ y = 15 m	-	Uwe's presentation (16.02.2009)
Longitudinal direction (z = 10 m from IP, R =0)	Less than 100 G	103 G	100G @ 2.3 m from iron end (9.6 m from IP)	200 G	100G @ 2.8 m from iron end (10.3 m from IP)	124 G	-	Uwe's presentation (16.02.2009)
Cold mass								
Coil	Inner radius	3615 mm				3615 mm		
	Outer radius	4000 mm				4000 mm		
	Half length	3675 mm				3675 mm		
Cryostat								
	Inner radius	3440 mm				3440 mm		
	Outer radius	4340 mm				4340 mm		
	Half length	3905 mm				3905 mm		
Magnetic parameters								
Central field		3.5 T		4 T				
Integrated field				17.34 T*m		16.10 T*m		
Stored energy				2,7 GJ			1,76 GJ	
Length of SC cable		29.4 km						1225 turns

from François Kircher

From this we conclude
that without correction coils

- the stored energy is dramatically reduced: 2.7 → 1.8 GJ
- the fringe field does not change much (with 3D simulation)
- the integrated field is reduced : 17.3 → 16.1 T*m
  then the B_0 has to be increased to get back to 17

We should stay then with such a model where the yoke can stay the same.

But the forces and distorsions induced on the FSP should be checked,
they may be more important!

The insertion of an antiDID has been studied (Saclay)
with a field about 700 G. The field value has to be checked.
The current design makes it supraconducting in the cryostat.

Have a field map.

The solution proposed for CLIC-ILD of coils to reduce the end caps
should be looked at for ILC but as a possible alternative
not a baseline.

The tank design, thickness and distorsions
is not part of the coil design but rather in the hands of the calorimeter group.
The expected deformations should be checked by coil people.

If agreed we should make these conclusions known.

Costing

This is discussed within a group with SiD and RD
and within the CLIC group

A good first approximation should be available by end of february, march (RD)

We have to make sure that all the items are identified
in particular those which are expected to come from the accelerator
e.g. the helium source.

We try to have a WBS similar between the different studies
but the SiD and ILD approaches are different:
SiD to have an industrial offer (global)
ILD to have a construction scheme more à la CMS.

CLIC is has been using a costing tool for its own evaluation,
we could follow.