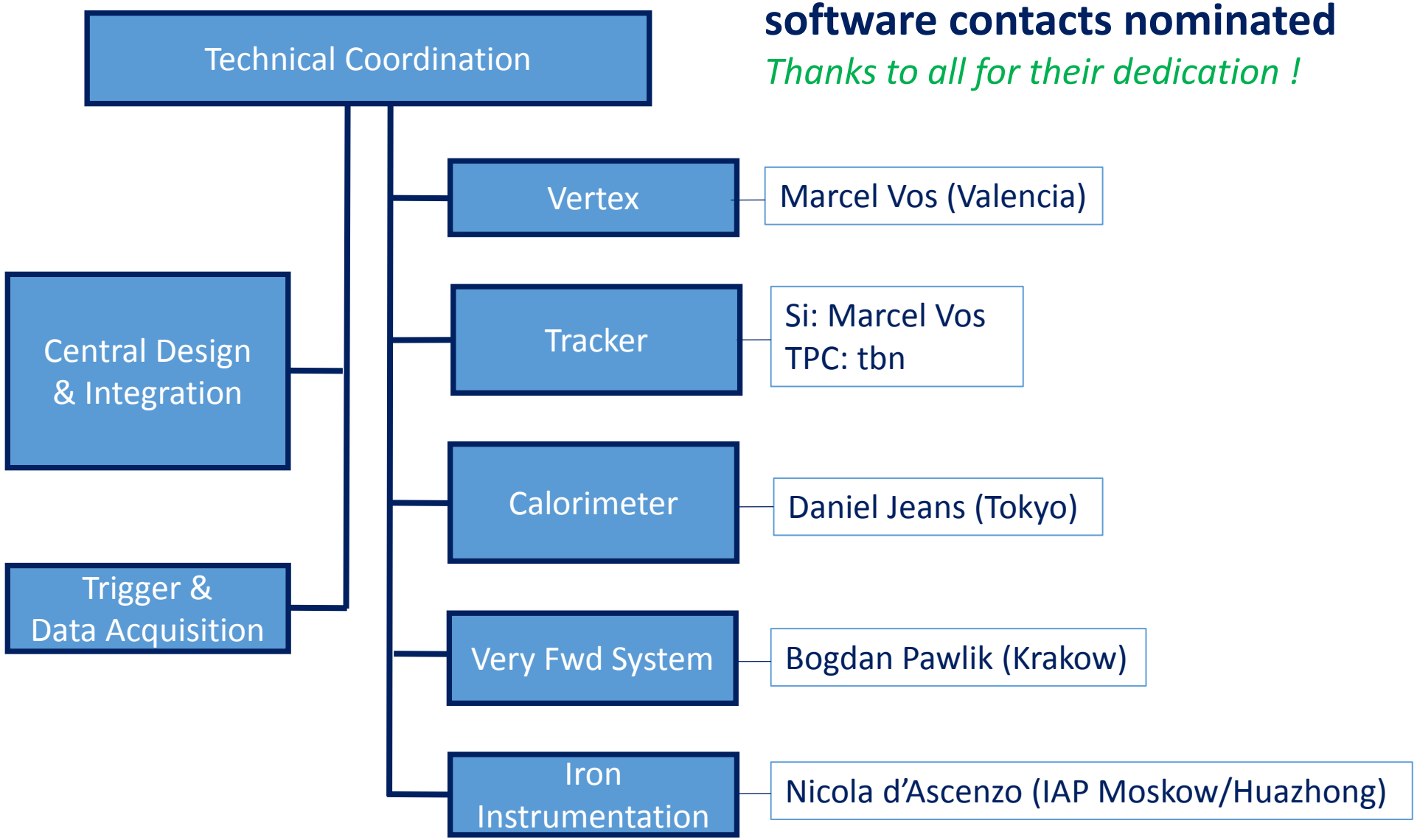
ILD meeting
20 July 2016

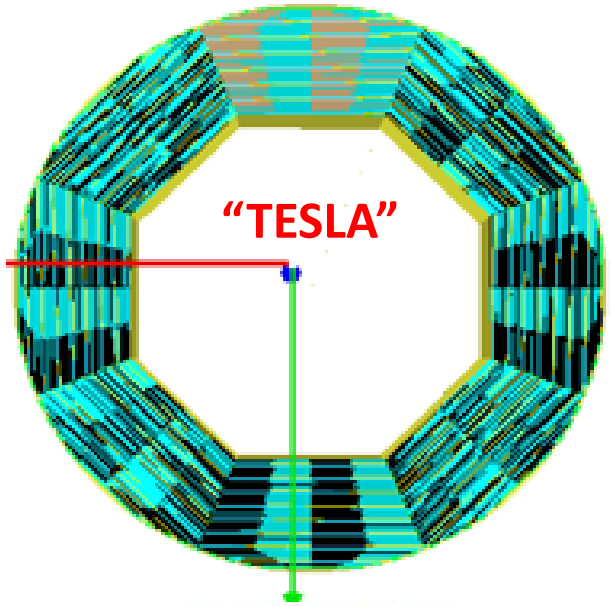
REPORT FROM THE TECHNICAL COORDINATOR

- **Subdetector software contacts**
- **VT and anti-DID task force program**
- **Detector models for optimization**

Most of subdetector software contacts nominated

Thanks to all for their dedication !





"VT TASK FORCE"

Investigate the two proposed HCAL mechanical options

Task Force members:

CDI conveners: K. Buesser, R. Poeschl, T. Tauchi

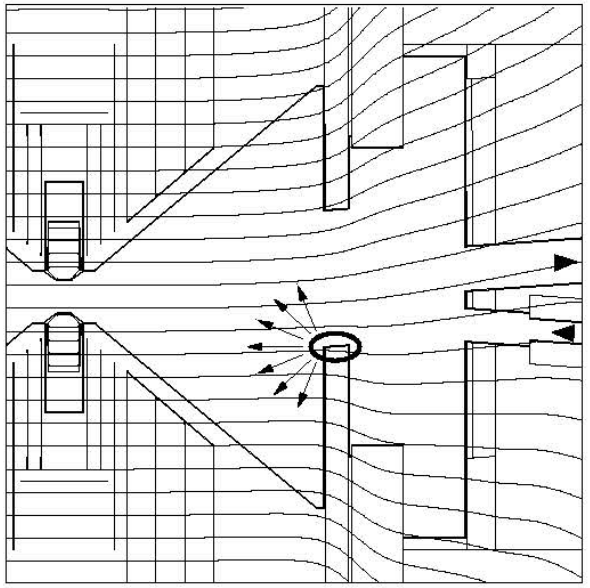
CALO conveners: J-C. Brient, I. Laktineh, W. Ootani, F. Sefkow

Issues to be addressed:

- Effect on physics of φ and z cracks (90^{o} and barrel-endcap transition)
- Mechanical stability (static and dynamic), to be also evaluated with a potentially smaller radius
- Transport / assembly procedures.
- Impact on ECAL design.
- Signal paths and electronics accessibility/reliability
- Implementation in ILD software

"ANTI-DID TASK FORCE"

Investigate need and feasibility of an anti-DID

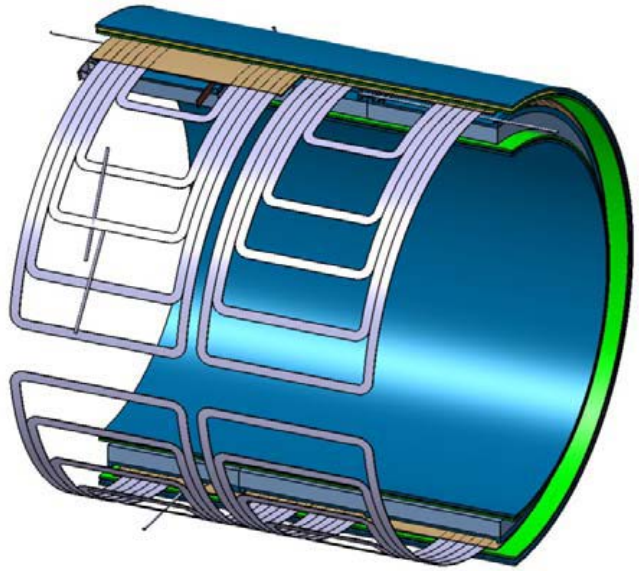


Task Force members:

CDI conveners: K. Buesser, R. Poeschl, T. Tauchi
VFS conveners: Y. Benhammou and S. Schuwalow
VTX representative: A. Ishikawa
TPC representative: P. Colas
Coil expert: Ch. Berriaud (Saclay)
BG simulator: tbn

Issues to be addressed :

- Technical feasibility of the anti-DID coil and the required B field map
- Compatibility of the B field and TPC requirements
- Combined optimization for both direct beamstrahlung and backscattered particles
- Effect on polarimetry
- Maximum tolerable occupancies of the Vertex and TPC
- Alternative simulation options (anti-DID dependent BG files)



TASK FORCE SHORT TERM TIMELINE

- Summer: nominate missing core members (e.g. BG simulator)

- Early Autumn: first 1 day workshop (for each task force) being organized for presentation/discussion of past studies on the relevant issues, and launch of necessary complementary studies.

  NB: independently but related to the anti-DID task force, contacts are being re-established with a Japanese coil manufacturer to discuss the ILD coil design and construction (including anti-DID option). Visit of K.Buesser and U. Schneekloth in Japan scheduled end September.

- End 2016/early 2017: second 1 day workshop, possibly with external experts, to come to conclusion as regards the physics benchmark high statistics simulation.

MORE DETAILS ON ILD MODELS FOR PHYSICS BENCHMARK SIMULATIONS

(see Ties' presentation)

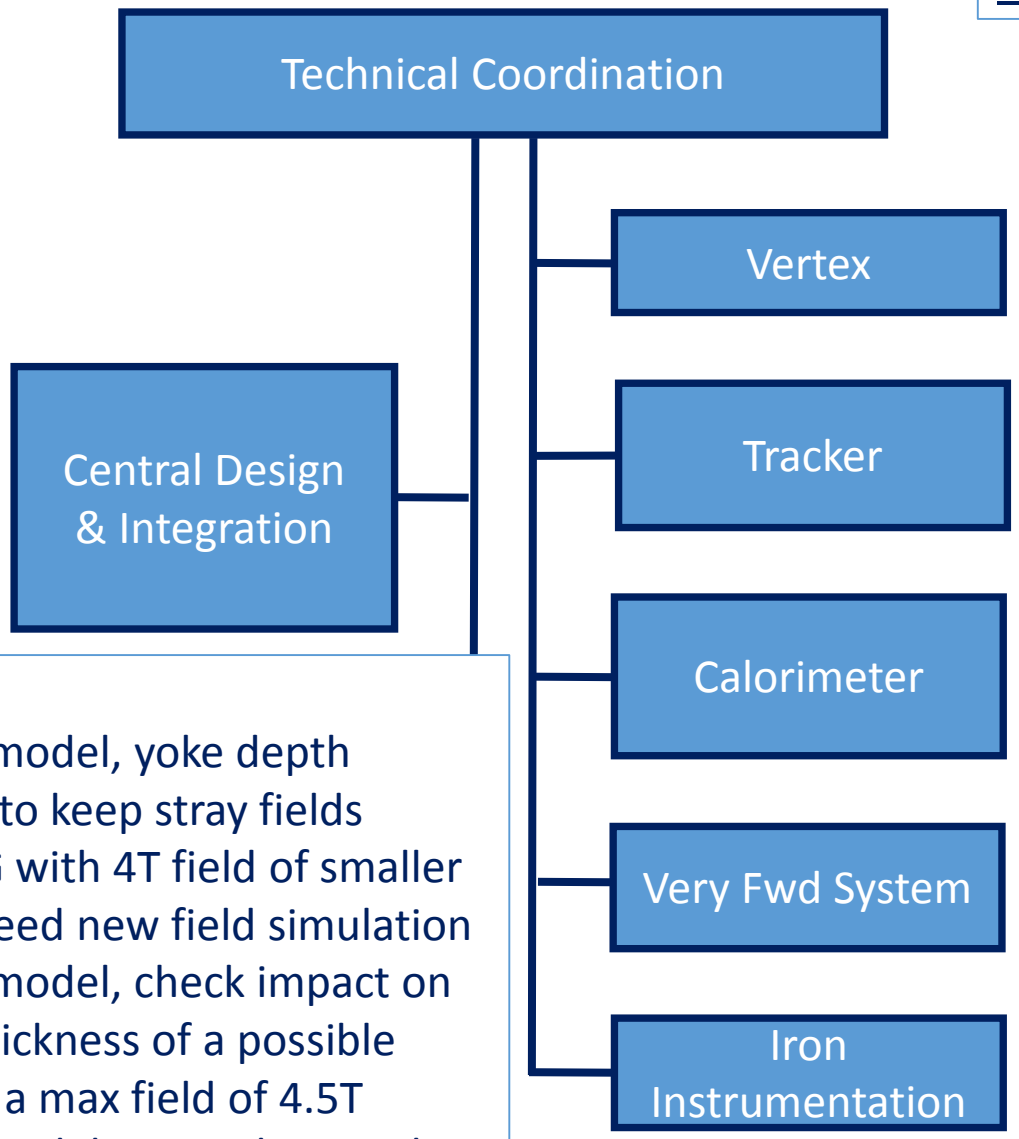
Detector	DBD	Small ILD
B-Field	3.5 T	4 T
VTX inner radius	1.6 cm	1.6 cm
TPC inner radius	33 cm	33 cm
TPC outer radius	180 cm	146 cm
TPC length (z/2)	235cm	235 cm
Inner ECAL radius	184 cm	150 cm
Outer ECAL radius	202.5 cm	168.5
Inner HCAL radius	206 cm	172 cm
Outer HCAL radius	335 cm	301 cm
COIL inner radius	344 cm	310 cm

Subdetector groups will be provided a new set of detector envelopes for both models, to be defined by the technical and software coordination

General principles

- One large model with same dimensions and B field (3.5T) as DBD, updated for new L*, and one small model with Santander proposed dimensions, with B field increased to 4T and vertex inner radius, TPC inner radius and ECAL-HCAL depths same as for large model.
- Gaps between subdetectors same for both models.
- For both models, simulation of subdetectors to be updated for new L* geometry, known bugs, intrinsic material simulation improvements and improved service description.
- For large model, all subdetector internal parameters left unchanged compared to DBD, unless a clear better configuration has been found since then.
- For small model, same internal configuration as for large model, apart for parameters related to overall size (e.g. cell sizes) which can be adapted.
- Optimisation of parameters not related to the 2 model sizes (e.g. #calolayers) left to focused studies.

Questions to subdetectors



Vertex: for both models, same geometry as for DBD ?

Tracker/Si:
- For both models, same FTD geometry as for DBD ?
- For both models, do we need a more realistic SIT/SET geometric implementation ?
- For small model, needs adapted SET geometry.

Tracker/TPC: for small model, decrease pad sizes along reduction of TPC level arm, or keep pads unchanged ?

CALO:
- For small model, adapt the cell sizes / granularity to reduced radius ?
- For both models, agree to remove pre-shower Si-layer in the barrel (assuming SET remains in simulation) ?

VFS: for both models, needs adaptation to new L* and to include new simulation for LHcal

Iron: for small model, adapt iron instrumentation to intrumentation gaps with smaller radius (same number of gaps as in large model)

CDI:
- For small model, yoke depth necessary to keep stray fields below 50G with 4T field of smaller coil ? -> need new field simulation
- For small model, check impact on magnet thickness of a possible design for a max field of 4.5T
- For both models, provide complete field map for simulation

OUTLOOK

- Nomination process to be completed in summer.
- Task force recap of past studies to be performed until first task force workshops early autumn.
- Detailed questions to be sent to subdetectors for new ILD models definition, answers expected mid-autumn. *NB: a parallel action to update and fill the subdetector interface documents is ongoing.*
- Brainstorming and focused studies are also currently launched to evaluate the feasibility of a generic common simulation of the main calorimeter technology options.
- A list of questions concerning subdetectors calibrations will be soon distributed in relation with an evaluation of the need for dedicated ILC running on the Z^o pole (see note by G. Wilson).