

ILD SOFTWARE WORKSHOP
22-26 February 2016

TECHNICAL COORDINATOR VIEW ON ILD OPTIMIZATION

- **General principles**
- **Global parameters**
- **Subdetectors**

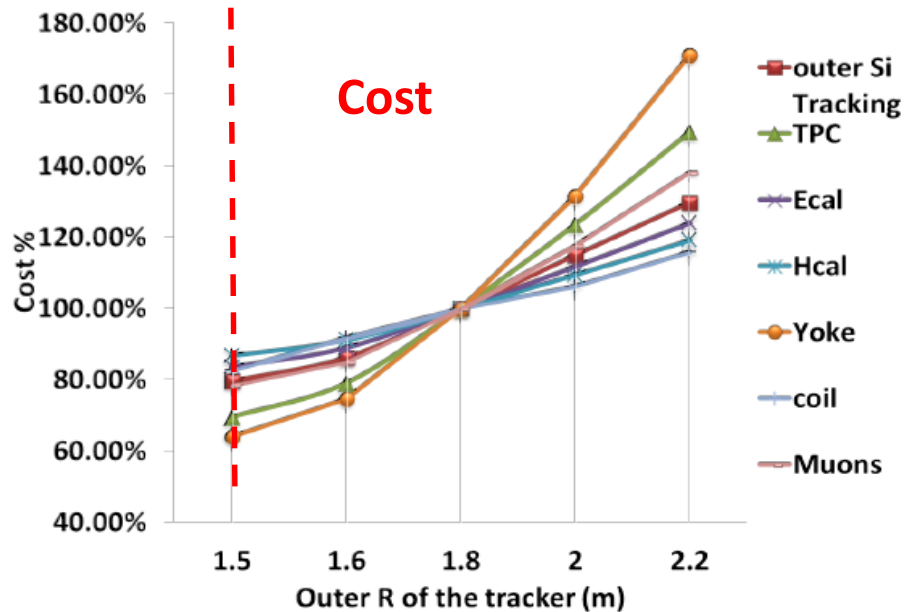
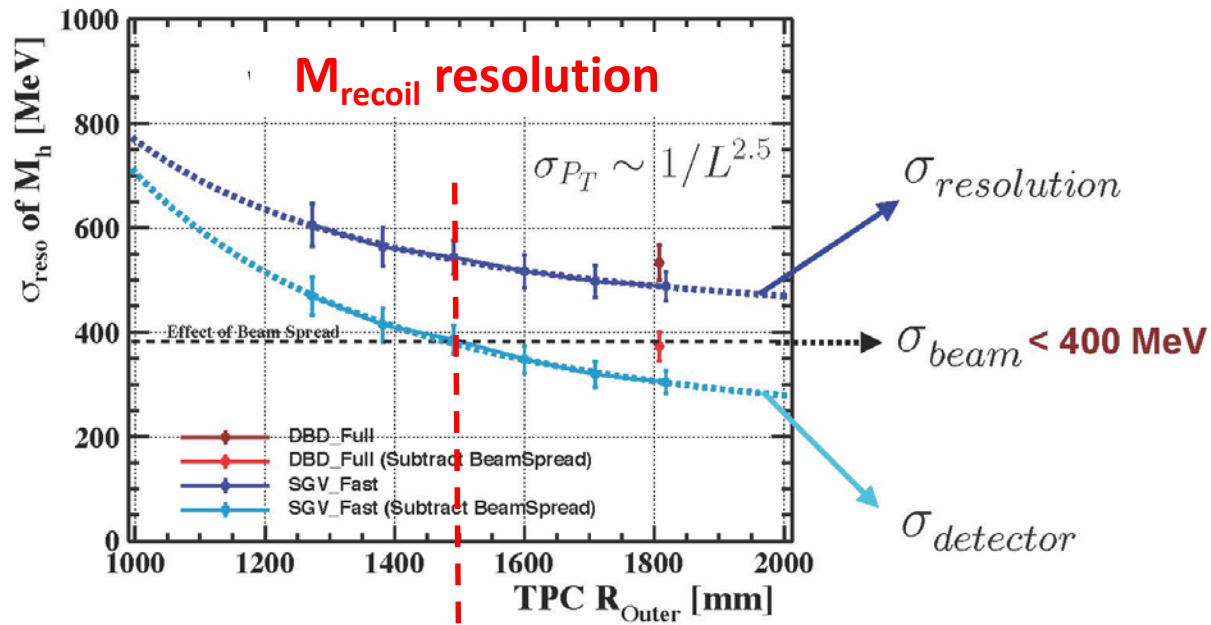
GENERAL PRINCIPLES

GOALS:

- Provide in ~2 years a new (light) document presenting an updated baseline design of the detector (*NB: no subdetectors technology decisions on this time scale*).
- Gather as much information as possible to be in situation to rapidly prepare a Detector TDR in case the ILC proceeds in Japan.

METHOD:

- Factorize intrinsic constraints (physics, etc...) from external contingent constraints (push pull, etc...) to keep benefit of studies in case the context evolves.
- Factorize global parameters (sizes, B field, structure, etc...), which have priority, from internal detector parameters (technology, granularity, etc...) which can be defined later.
- Include “reality” parameters (services, integration, cost, etc...) into optimization criteria.
- Work in close cooperation with other consortia (CLICdp, SiD) to avoid duplication of efforts and allow cross-checks / comparison of results.



GLOBAL PARAMETERS : Size

- Already existing indications that a reasonable detector radius option might be around 1.5 m.
- Suggest to have at most 2 detector size options for the comprehensive physics benchmark simulations, far enough from each other to see significant differences in the performance and get the derivative.

Concept\Key param.	ILD (DBD)	CLICdet_2015 (3 TeV)
Tracker	TPC	Silicon
Solenoid Field [T]	3.5	4
Solenoid Free Bore [m]	3.3	3.4
Solenoid Length [m]	8	8.3
VTX Inner Radius [mm]	16	31*
ECAL Inner Radius [m]	1.8	1.5
ECAL ΔR [mm]	172	159
HCAL Absorber B / E	Fe	Fe
HCAL λ_1	5.5	7.55
Overall Height [m]	14	12.8
Overall Length [m]	13.2	11.4

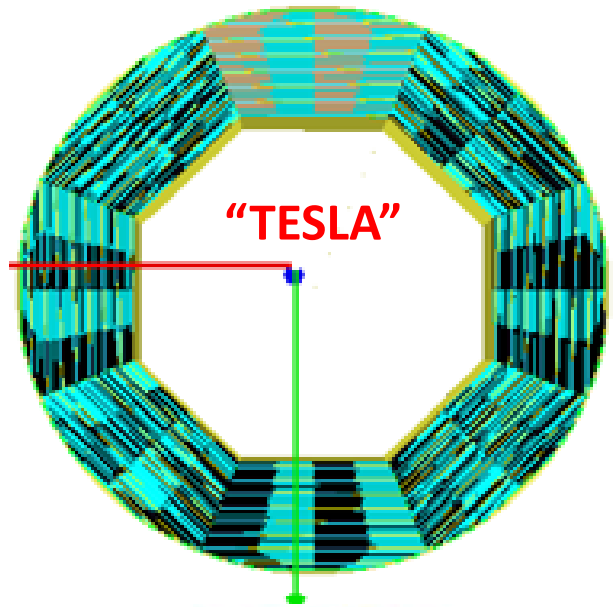
GLOBAL PARAMETERS : Size cont'd

Suggest to take for the 2 sizes :
the DBD configuration and something close to CLICdp

Both differ mainly by the tracker radius

Advantages :

- Keep DBD configuration as reference to quantify improvement of methods/components
- Allow comparison/cross checks with CLICdp
- Allow comparison between TPC and Si tracker options



GLOBAL PARAMETERS : other points to be fixed before comprehensive physics benchmarks simulations

- Baseline calorimeters mechanical structure (TESLA ↔ Videau)
- Need for anti DID (→ field map)

Reviews with external experts to be organized soon

Stray fields (→ yoke size) need also better understanding

SUBDETECTORS

Comprehensive physics benchmark samples should (ideally) :

- allow further tuning of granularities (#layers, cell sizes) and comparisons of technologies
- Include realistic 1st order description of detector services, dead zones, etc...

Subdetector working groups are currently being set up. They will be asked to :

- contribute to the validation of their simulation software within the global ILD simulation framework (simulation contact person to be nominated in each working group)
- provide interface documents with information on their external boundaries and services