LCTPC: discussion on the future

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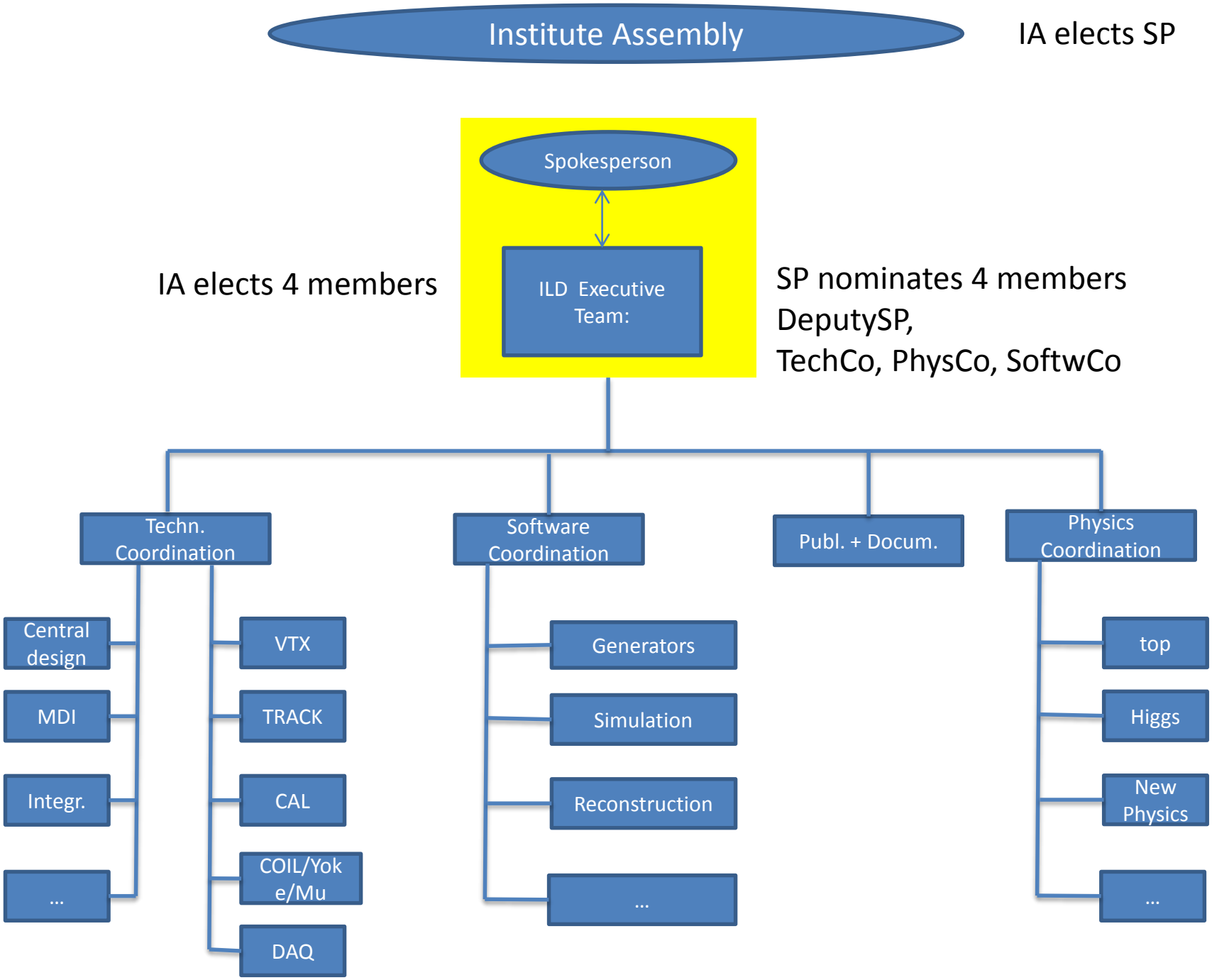
- “new name”(?):

  LCTPC → LCTPC (Lepton Collider TPC ?)

- Detector groups in ILD (see next chart):
  - Tracking group or (separate) TPC, SiTrack (central, forward)?
  - For TPC group, we have to get organised. Overlap between members of ILD TPC group and LCTPC will be large?


Institute Assembly
IA elects SP
Spokesperson
ILD Executive Team:
IA elects 4 members
SP nominates 4 members
DeputySP,
TechCo, PhysCo, SoftwCo
Techn. Coordination
Software Coordination
Publ. + Docum.
Physics Coordination
Central design
MDI
Integr.
...
VTX
TRACK
CAL
COIL/Yoke/Mu
DAQ
Generators
Simulation
Reconstruction
...
top
Higgs
New Physics
...

From ILD Rules/Structure

ILD Systems groups

The ILD detector consists of several distinct sub-detectors. System groups are responsible for the different sub detectors. They coordinate the development of the implementation into ILD, and forge where needed links to relevant R&D groups. They define the layout of the sub-system in ILD, and propose technical solution to the concept group. They identify together with the R&D groups open issues and discuss how these can be solved. They define with the integration group the integration into ILD, identify open issues, and propose ways to solve them. They interact with the DAQ and software groups to understand and define the integration of the sub-detector into the central ILD DAQ and software.

Each systems group proposes one system group leader and one deputy leader. The appointment is finally endorsed by the Institute Assembly. The ILD system groups are coordinated by the Technical Coordinator.

An important role for ILD is played by the R&D collaborations. The R&D collaborations develop the technologies on which the ILD sub-detectors are based, including carrying out testbeam experiments. Wherever possible, ILD will build on the work done by the R&D collaborations. ILD profits from a broad approach towards technological innovation by the R&D groups. It supports this by a policy of openness and close collaboration with the R&D groups. Matters relevant to the ILD detector system – that is, the application of a technology to a concrete sub-detector, the sub-detector optimization, and ultimately the costing, are considered topics for ILD.

Current situation

- LP infrastructure at DESY testbeam (see next talk by Ties)
- 3 types of MPGD modules being investigated
  - GEM modules (by DESY and Japan groups)
  - Micromegas modules (by Saclay+Carleton groups)
  - Ingrid (TimePix) modules (by Bonn, NIKHEF+Saclay groups)
- "All" modules work satisfactorily (to a certain level):
  - Similar (single) point resolution for the GEM and Micromegas modules in Rϕ (is this also true for z?)
  - For Ingrid modules, (more) detailed analysis of testbeam data needed/ongoing. But remember "Neff" = 1! So comparison at track level more appropriate.
  - There are distortions; being analysed/corrected; goal is to reduce distortions as much as possible
- Still (occasional) HV issues; long term HV stability tests needed
- Gate studies ongoing

Things to be done (incomplete list)

- Reconsider performance parameters; need input/checks from ILD performance studies
  - Single point resolution Rϕ (as function of R?)
  - Single point resolution z
  - Two-hit separation (as function of R (i.e. of occupancy)?)
  - dE/dx
    - What is needed?
    - What can we deliver?
  - Granularity i.e. pad size
  - Gating performance
- Further cooling studies; overall temperature uniformity/stability
- Power delivery and power pulsing
- (common) DAQ
- UV laser beams
- …..

Two scenarios (well maybe three…)

- Fast (positive) decision:
  - MEXT gives green light
  - We have to be “ready” within 2-3 years
  - What do we have to do very urgently in view of a technology decision?
  - What necessary parameters do we still need to study?

- MEXT gives green light, but with longer time scale (5-6 yrs) before start of construction:
  - More (other) infrastructure needed?
  - Hadron test beam? Common with VTX, SiTrack, Calo?
  - Testbeam at SLAC (~ILD time structure)?

- Red light, but green light for CEPC?
  - What is our position?

Things to be done (green light)

- Reconsider performance parameters; need input/checks from ILD performance studies
  - Single point resolution Rϕ (as function of R?)
  - Single point resolution z
  - Two-hit separation (as function of R (i.e. of occupancy)?)
  - dE/dx
    - What is needed?
    - What can we deliver?
  - Granularity i.e. pad size
  - Gating performance
- Further cooling studies; overall temperature uniformity/stability
- Power delivery and power pulsing
- (common) DAQ
- UV laser beams
- ….. Long drift gas studies, long term HV stability, ageing

- Would cost (difference) still be a significant factor in the technology choice?

Things to be done (green but 5-6 yrs)

- Reconsider performance parameters; need input/checks from ILD performance studies
  - Single point resolution Rϕ (as function of R?)
  - Single point resolution z
  - Two-hit separation (as function of R (i.e. of occupancy)?)
  - dE/dx
    - What is needed?
    - What can we deliver?
  - Granularity i.e. pad size
  - Gating performance
- Further cooling studies; overall temperature uniformity/stability
- Power delivery and power pulsing
- (common) DAQ
- UV laser beams
- ….. Long drift gas studies, long term HV stability, ageing
- + what else?

3rd scenario: no ILD, but CEPC

- How we position ourselves?
  - What does/can ILD do?
  - Should LCTPC (independently of ILD) offer our expertise for a TPC main tracker?
  - Or leave it to individual groups to decide whether to join or not?

(it is unlikely that BOTH would proceed?)