

Status of the detector activity

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Meeting with FALC@ SLAC

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Physics prospect

- We hope new physics shows up soon, from LHC or other

Higgs, SUSY, Hidden dimension,....

- Then ILC will be a powerful facility to clarify and scrutinize the signal.

ILC will open a new field of research.

- In colliders, the accelerator and detectors are linked very closely, at an e^+e^- collider in particular. **Detector study must advance together with accelerator design.**
- **They must be of unprecedentedly high performance to solve the anticipated questions.**

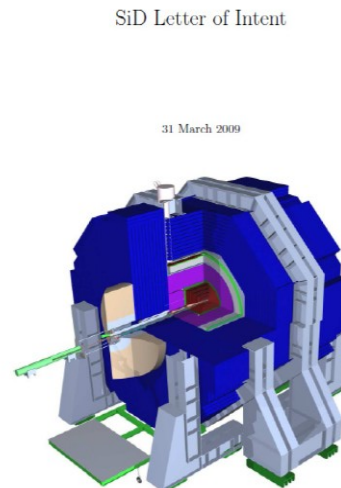
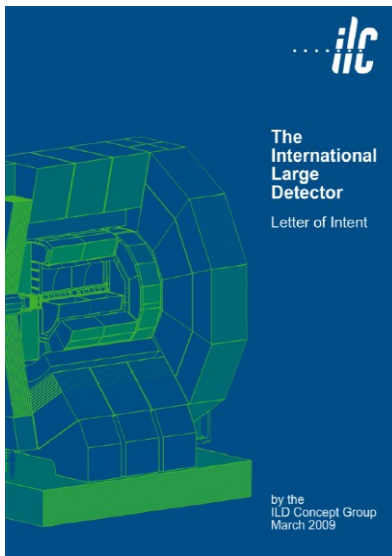
Letter of Intent Process

- International Linear Collider Steering Committee called for Letters of Intent in 2007 to make detailed detector designs for ILC.
- It was not meant that detectors be built but
 - to fix accelerator parameters at IR with realistic detector designs and
 - to show feasibility of doing desired physics.

Validation and Monitoring

The two groups, **ILD and SiD**, are striving for these ends.

Their concepts were validated in 2009 and their progress is monitored regularly by the International **D**etector **A**dvisory **G**roup.



General Remarks on Participation

- Many university groups(>200) are participating **motivated by their interest in the ultimate physics goals and potential of a linear collider.**
- There is no central source of support.
Each participating group secures its own support independently through local funding agencies.
- This follows the tradition of the field for large collider experiments.

Where we are:

- The detector study advances towards **detailed baseline design** to be completed in 2012.
- The study includes:
 1. **component R&D for feasibility proof,**
 2. **their integration into a optimized detector system having required precision,**
 3. **Its integration into the accelerator Interaction Region,**
 4. **physics simulation to demonstrate the capability of the detectors running at ILC.**

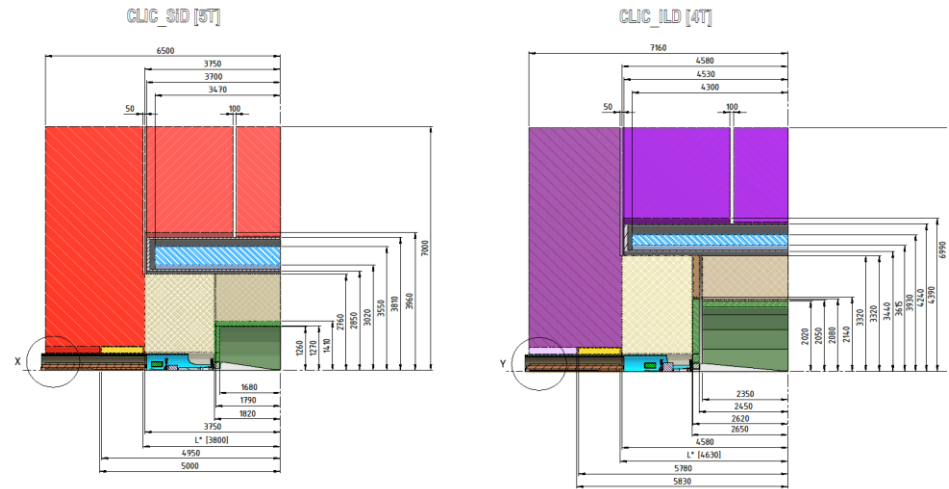
Component R&D

- Various components are studied all over the world (some by component-level collaborations):
 1. Calorimeters (EM-CAL, H-CAL, Forward CAL)
 2. Tracking devices (vertex tracking, main tracking, muon tracking)
 3. Solenoid Magnet
 4. Powering and DAQ
- They made big progress.
- **There are application already in other experiments and fields. The development is beneficial to the whole community or science.**

Application

- Both detector concepts, ILD and SiD, are used for CLIC detectors.

SiD' & ILD'



PAC Valencia May 2010

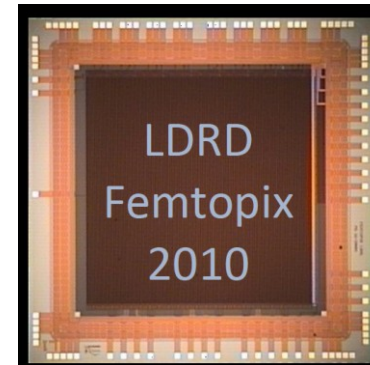
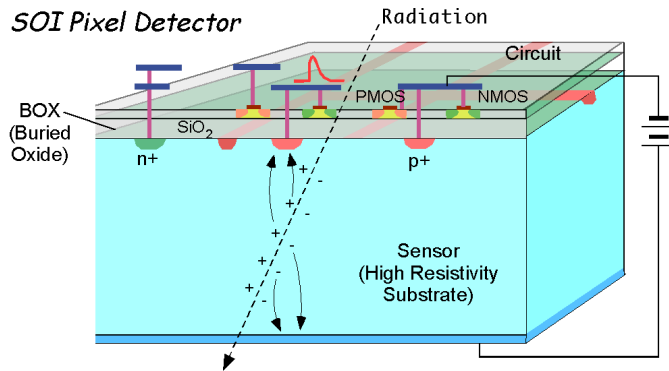
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- Particle Flow Algorithm (to measure hadron-jet energy precisely) is deployed by CMS experiment at LHC.
- Various component technologies are also applied widely.

We will make a survey over the whole area.

Only a few examples

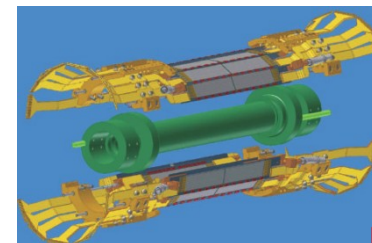
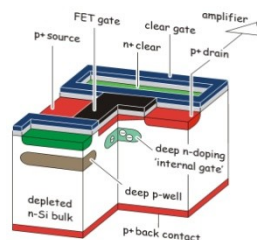
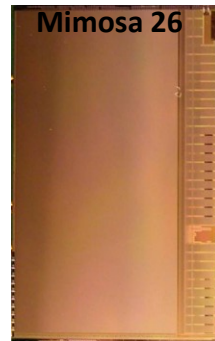
- Silicon On Insulator started as purely ILC driven technology



X-ray detection with femtosecond timing (LBNL)

Beam test telescope at DESY and CERN

- DEPFET



J, Oct. 18-22, 2010 -- M. Demarteau

Belle

Concern for the future R&D

- The groups could obtain resources so far.
- **However, in each region funding faces a change.**

Example

Europe: EUDET ----> AIDA (more programs)

US: Funding scheme is changing

Japan: The grant terminates. A new proposition being made.

Tendency: the available resources are decreasing

We need to continue over 2012 to complete R&D.

Integration

- **Integration is a crucial part of the study**

to fix IR parameters with realistic detector designs and to demonstrate the performance.

Experience: After integration, performance tends to deteriorate. **Check performance after integration!**

- **Engineering support is indispensable, and certain supports are provided by many labs.**
- **They are scattered in different areas and from different labs.**
- ***In order complete the study in 2012, it is desirable such support be doubled.***

Next plan after 2012

- *The community wonders how the project will be brought forward after 2012.*
- “What will happen when the detailed baseline design is completed.”
- “How remaining R&D work can be pursued. “
- We welcome ILCSC’s consideration for a post-2012 step.
- Detector and Physics community wishes to participate in the discussions to make a concrete plan.