The SiD concept

Yannis Karyotakis
LAPP Annecy / IN2P3

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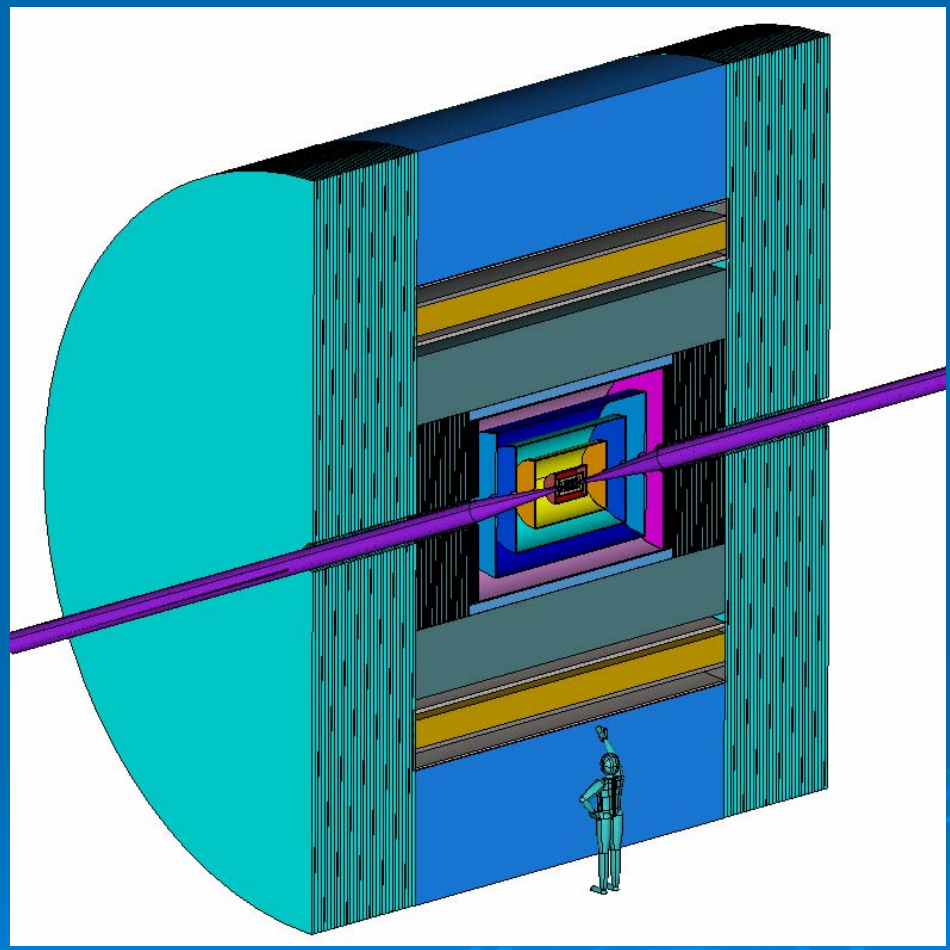
Main ideas

- An high performance detector optimized to study e^+e^- collisions of 0.5 to 1 TeV
- The Particle Flow resolution drives the detector design through the ECal
- Integrated, optimized, hermetic detector
- Cost has to be reasonably constrained

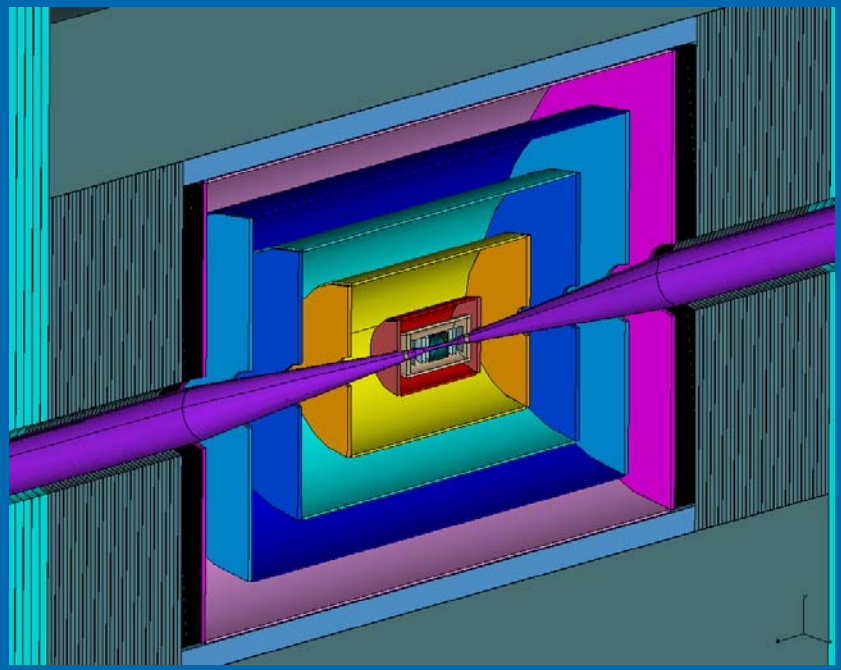
The detector concept

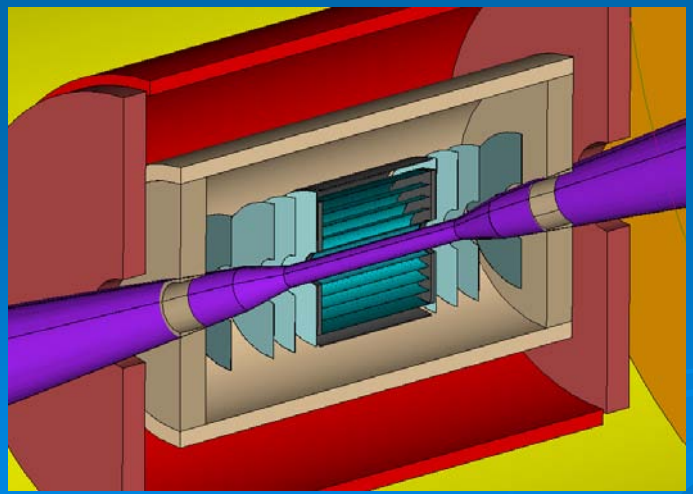
- Excellent integrated tracking and vertexing system
- Compact calorimetry
- High magnetic field



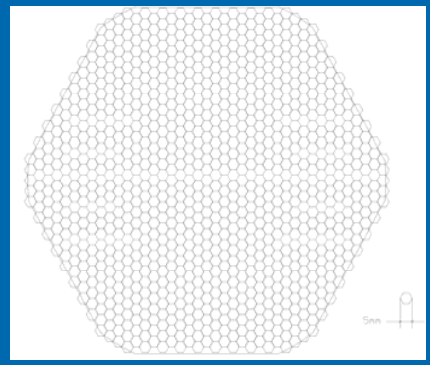
Tracking and Vertexing

- Fully Integrated system
- Excellent pattern recognition and momentum resolution
- Robust operation





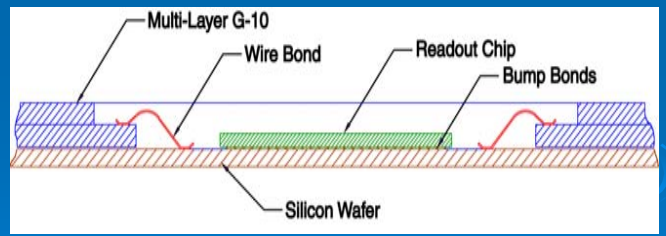
Calorimetry



- ECal Si/W
  - Keep it compact
  - Keep effective Molière radius small

•Many channels (1-2K) on one ASIC
•Thin wafers

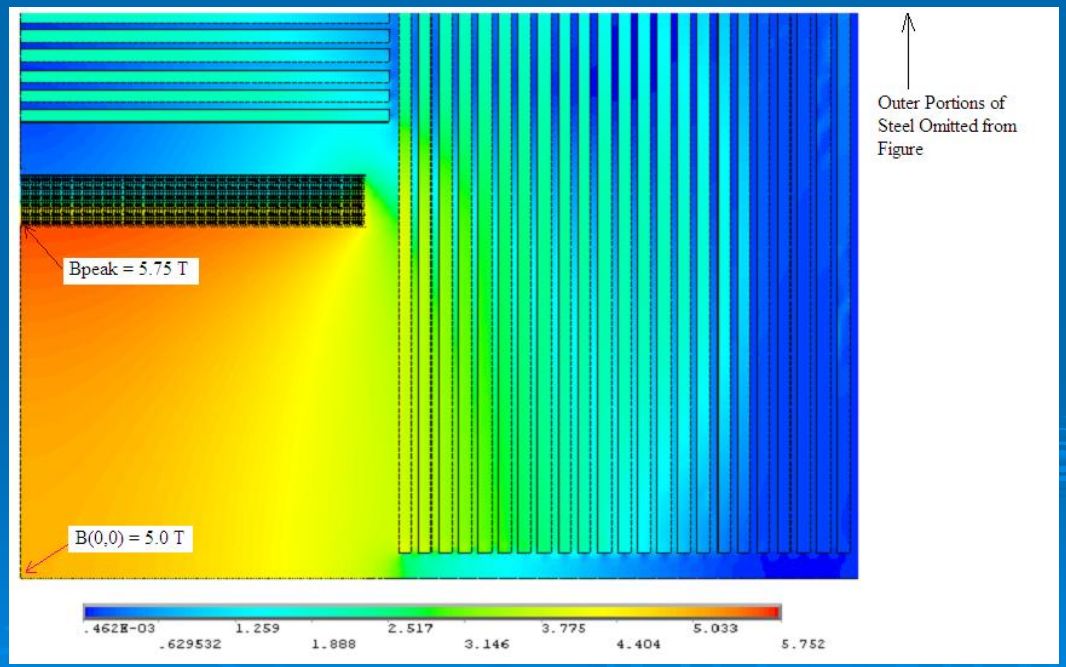
- HCal
  - ≈ 4 λ : 34 × 2 cm Fe or W
  - RPCs, GEMs, scintillator
    - Glass RPCs, in simulation



Solenoid and Flux return

- B=5 Tesla
- Stored energy ~ 1.2 GJ
- CMS solenoid sets current scale.

First ANSYS 2D, 3D Modeling



Feasibility study underway to at least convince ourselves that 5T can be built .

Ongoing Muon R&D on layout (flux return) and detector technologies

SiD Organization

Design Study Coordinators

J. Jaros and H. Weerts
Asian and European Contact Persons H. Aihara and Y. Karyotakis

SiD Executive Committee

Design Study Coordinators
SiD R&D Coordinator A. White
Godfathers M. Breidenbach and J. Brau

SiD Advisory Group

SiD Executive Committee
Working Group Leaders

SiD Working Groups

Benchmarking (T. Barklow), Calorimetry (R. Frey, J. Repond), Forward Calorimetry, Costs (M. Breidenbach), Magnet/Flux Return, Muons, Simulation (N. Graf), Tracking (M. Demarteau, R. Partridge), Vertexing (D. Su), MDI Liaison.

Road to Snowmass

- LCWS05 — Settle on critical questions and goals
- April — **Working Groups define simulation studies and other work needed to answer critical questions by Snowmass, engage help, start work.**
- May-August — Working Group meetings push studies and review progress.

  Monthly Advisory Group meetings push overall detector design, review sub-system progress.
- Mid-June — Advisory Group meeting at Fermilab. Mid-term review.

- before Snowmass — Be ready with sub-system designs, based on realistic mechanical concepts, justified with simulated performance. Design tools ready. Benchmarking analyses ready.
- at Snowmass — Review subsystem designs and starting point performance. Optimize overall detector. Review technologies and mechanical design and choose baselines.

Concluding remarks

- Join (not exclusive) and work on SiD design
- Unique chance for the Design Study to make real headway, **integrate all the subsystems into *one* design, optimize the *overall* design,** debate the relevant technologies, understand the physics/detector interplay.
- Study physics performance for several key physics measurements for a variety of detector configurations (e.g. change R, change B, change z,…). Watch the errors vs costs.

http://www-sid.slac.stanford.edu
http://sid.fnal.gov or http://ilc.fnal.gov