

Introduction to the seminar

ILC Detectors: Status and Prospects

Akiya Miyamoto

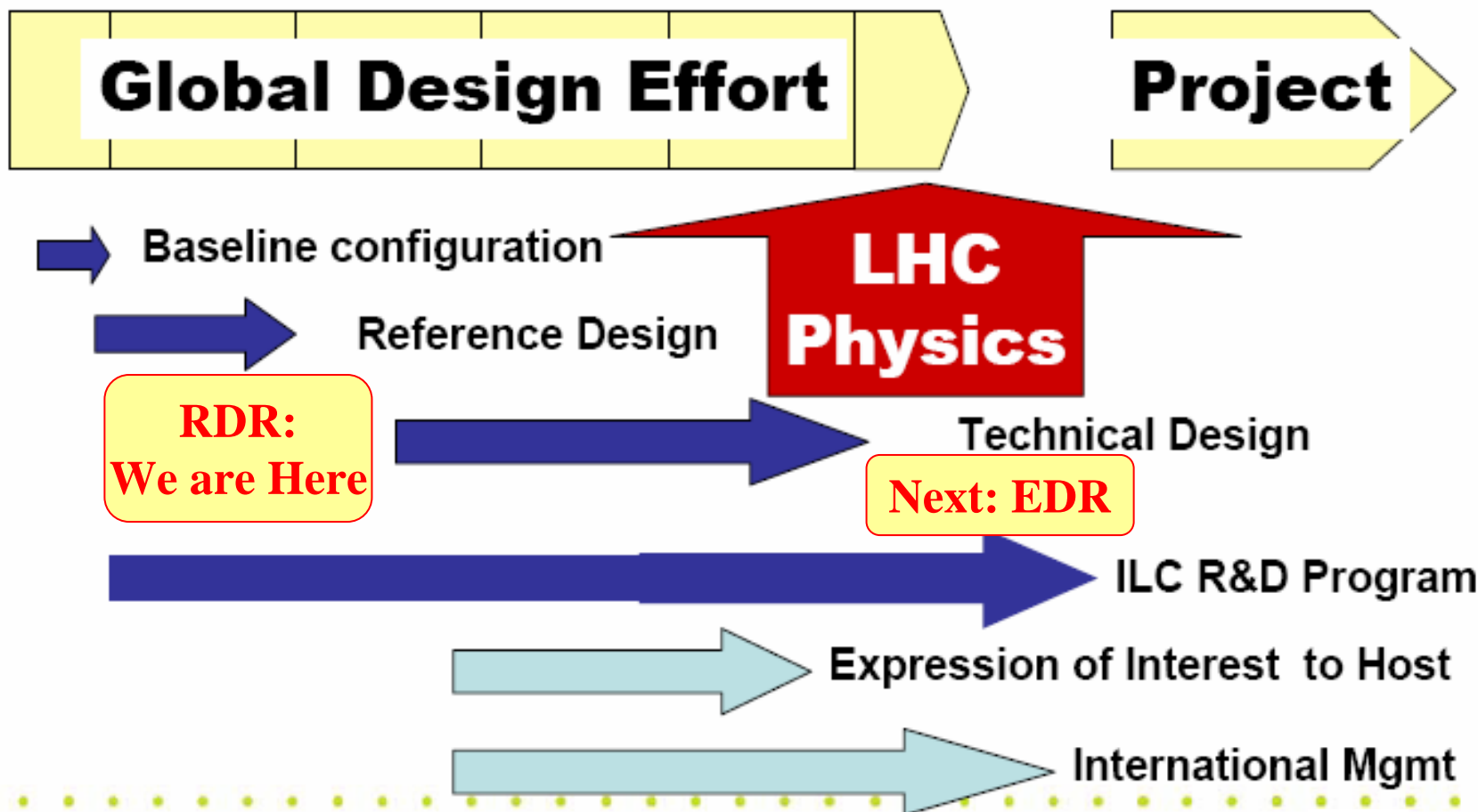
KEK IPNS

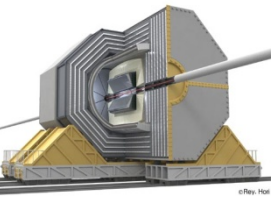
18 July 2007



The GDE Plan and Schedule

2005 2006 2007 2008 2009 2010





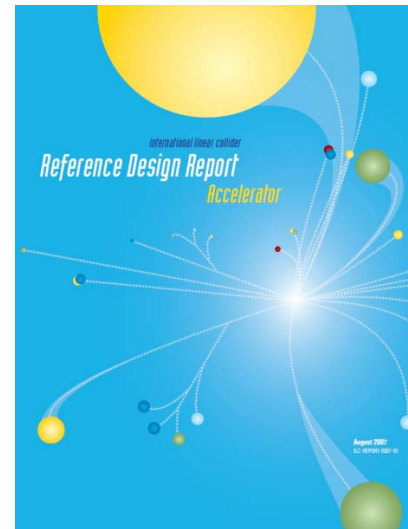
Reference Design Report



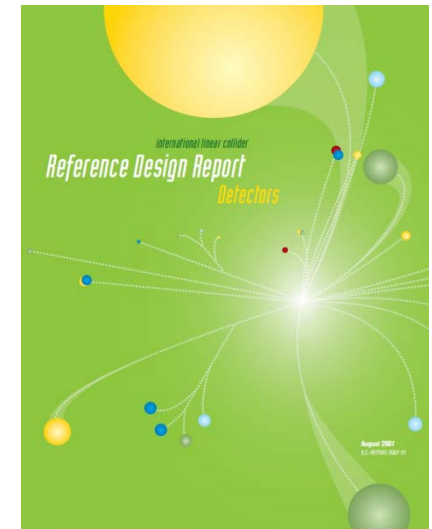
Vol. 1 Executive Summary



Vol. 2 Physics

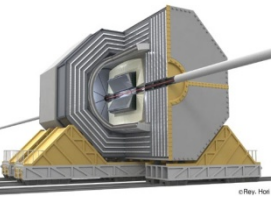


Vol. 3 Accelerator



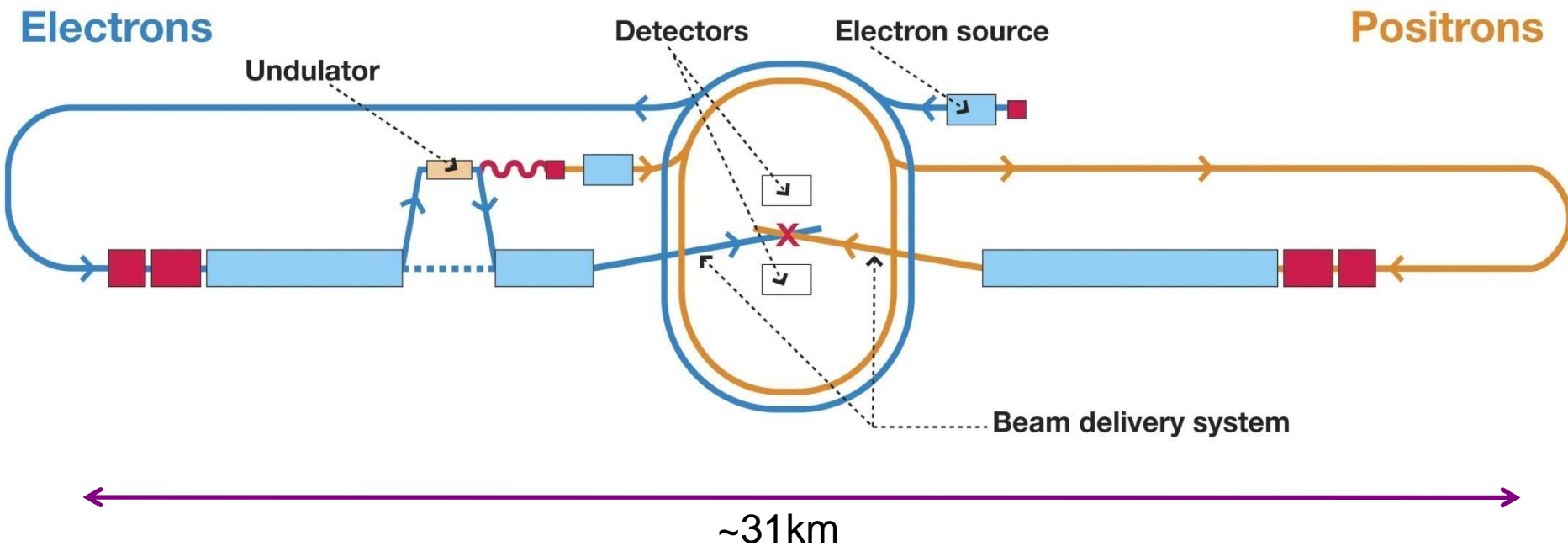
Vol. 4 Detectors

- Final Release is at Daegu, August 2007.
- The latest draft: <http://ilc.kek.jp/RDR> (Asian mirror site) ~680 pages
- Links to the draft version for physics and detectors available at http://www.linearcollider.org/wiki/doku.php?id=dcrdet:dcrdet_home
- Authorship: those who have contributed, plan to contribute, or just want to support the project, are welcomed to sign up from <http://www-flc.desy.de/dcr>

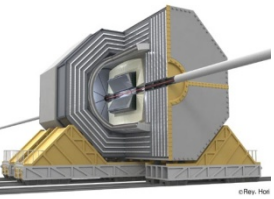


ILC Configuration

Layout for $E_{cm}=200\sim 500$ GeV, $L\sim 2\times 10^{34}\text{cm}^{-2}\text{s}^{-1}$

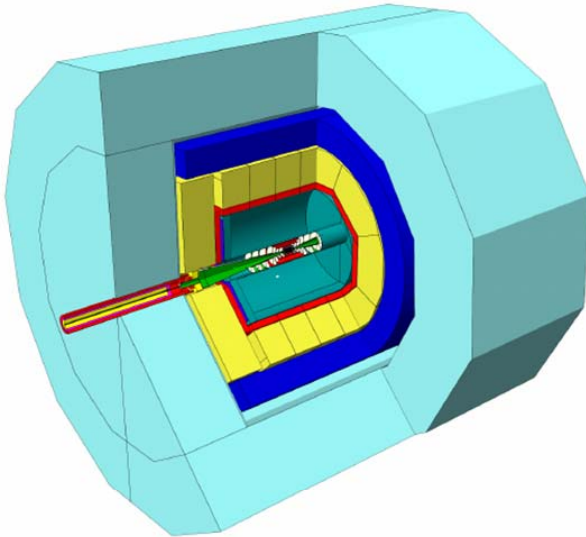


- ✓ Pulse rate = 5Hz, 1000~5400 bunches in ~1msec pulse
- ✓ 1 IR is shared by two detectors
- ✓ Beam crossing angle – 14mrad

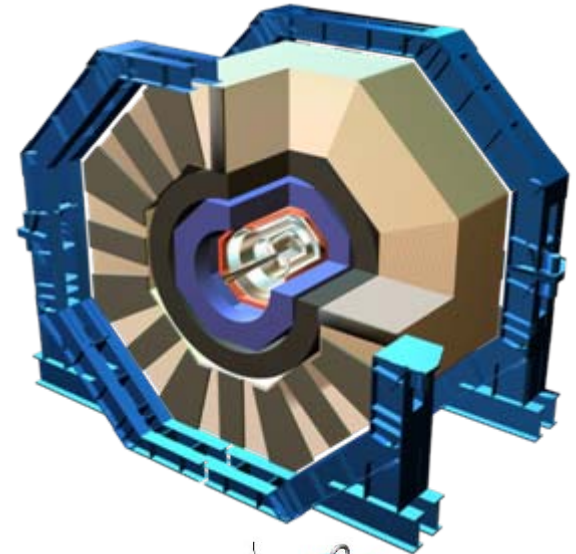


Detector Concepts

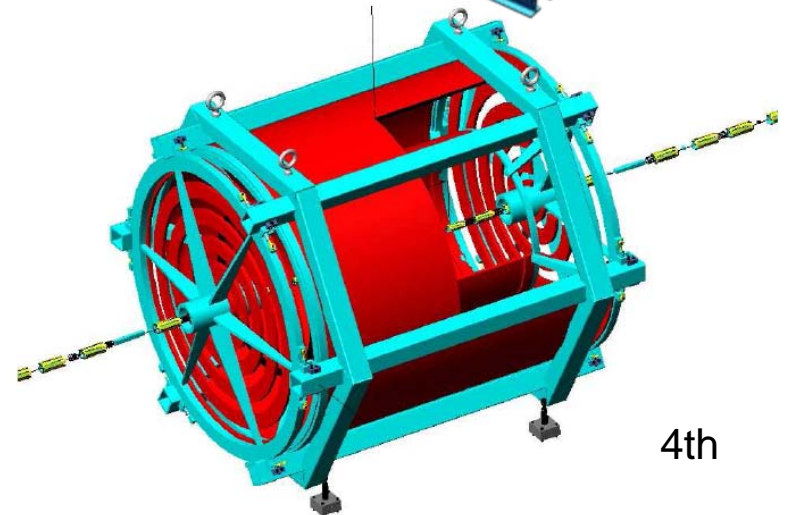
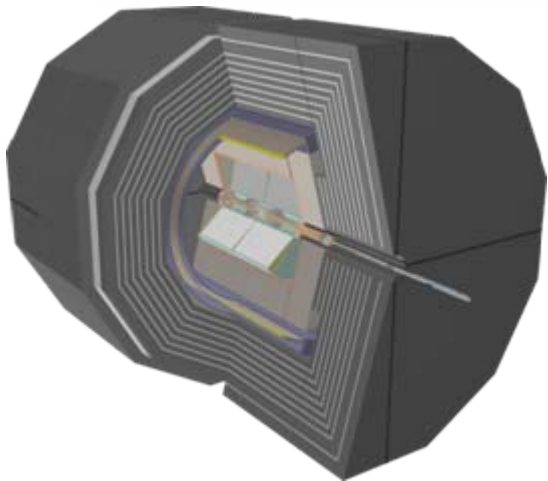
LDC



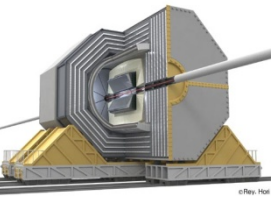
SiD



GLD



Detector concept team is not a collaboration.

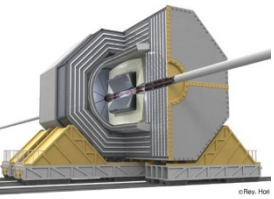


Detector Concepts

	Tracking	ECal Inner Radius	Solenoid	EM Cal	Hadron Cal	Other
SiD	silicon	1.27 m ↓	5 Tesla ↑	Si/W	Digital (RPC..)	Had cal inside coil
LCD	TPC gaseous	1.68 m ↓	4 Tesla ↑	Si/W	Digital or Analog	Had cal inside coil
GLD	TPC gaseous	2.1 m	3 Tesla	W/ Scin.	Pb/ Scin.	Had cal inside coil
4th	TPC gaseous	1.4 m	3.5/1.5	crystal	Multi- fiber readout	Double Solenoid (open mu)

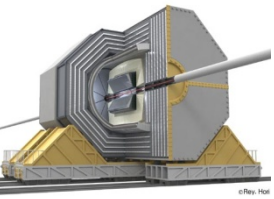
See Detector Outline Documents for details

- <http://physics.uoregon.edu/~lc/wwstudy/concepts/>



ILC Detector Roadmap

- ILC detector roadmap has been discussed in ILC community, WWSOC and ILCSC since last year
- Boundary conditions
 - ✓ ILC IR design needs input from detectors.
 - Can push-pull scheme works? Beam stability? Magnet fields? ...
 - ✓ Detector construction will take similar time as accelerator.
 - Accelerator will take ~ 7 years. Detectors are assembled on surface similar to CMS. But CMS took ~ 6 years for construction
- Detectors should be prepared in phase with the accelerator → Detector EDR in ~2010
 - ✓ GDE will prepare (ready for the project approval) EDR in 2010
- Openness of the detector program should be maintained



ILC Detector Roadmap - 2

Road map endorsed by ILCSC in June 2007

■ Summer 2007

- ◆ ILCSC announces call for LOI due Summer 2008.
LOI is "to express an interest to design , engineer and eventually build a detector at the ILC"

■ Summer 2008

- ◆ Detector design teams submit LOI.

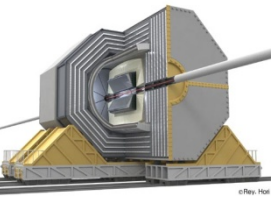
■ End 2008

- ◆ Two detector designs recognized for development toward the engineering design phase.

■ ~2010

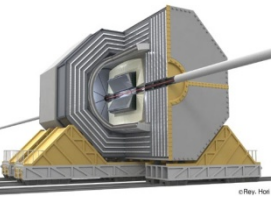
- ◆ Engineering designs completed for two detectors in a synchronized way with the accelerator EDR.

- *The process is open to new comers to join.*
- *Some sub-detector technologies choices may be open.*



Exp. Program Management

- **ILCSC**: A body to oversight the global effort of ILC, including the experimental program.
- **WWS** is a bottom-up organization and has been guiding the experimental program.
- In order to enhance *the executive authority and its accountability* with respect to the ILCSC in the era beyond the RDR, ILCSC has decided to appoint the Research Director.
- **Research Director**
 - ◆ Appointed by and reports to the ILCSC
 - ◆ Responsible for the experimental program.
 - ◆ Advisory / Review structure : under discussion



Today's Program

- Introduction
Akiya Miyamoto, KEK
- GLD-LDC Detector Concepts,
Yasuhiro Sugimoto, KEK
- SiD Concept and detector R&D in the US
Harry Weerts, ANL