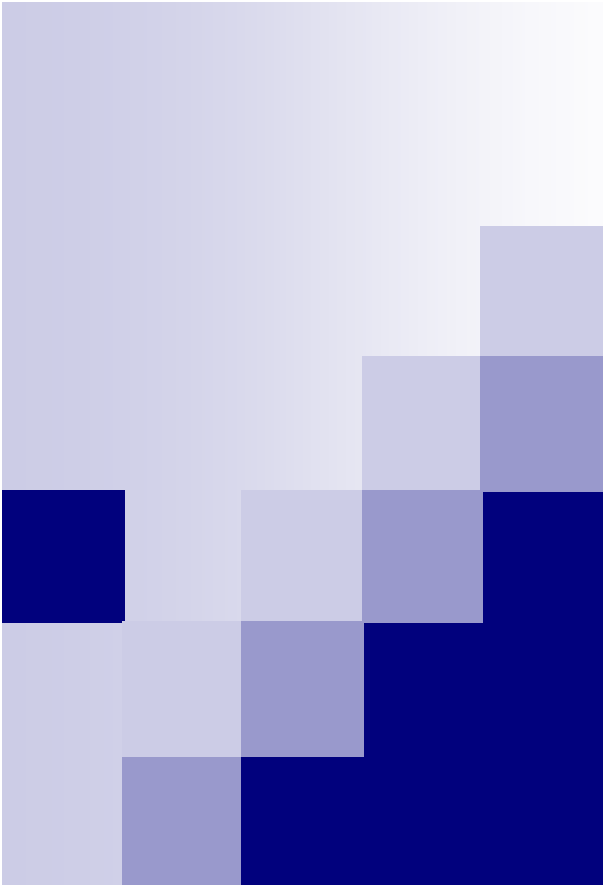
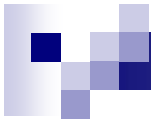




Asian calorimeter activities and plans

LCWS05 at Stanford, 2005/Mar/20

K. Kawagoe / Kobe-U



Contents

- Status of Asian testbeam facilities
- Tsukuba Drift Chambers at DESY
- Testbeam plans of Asian calorimeter studies
 - Scintillator-based ECAL
 - Si/W ECAL



Asian testbeam facilities (obsolete, as of Durham WS)

KEK PS	0.2 - 4 GeV	e, μ , π , K, p, p-bar	- April 2005 ?
KEK Linac	0.1 - 4 GeV ($\rightarrow$ 8 GeV?)	e, μ (?), π , K, p, p-bar(?)	?? Fall 2006 -
IHEP- Beijing	0.2 - 1.2 GeV	e, π , p	Available now Users welcome
J-PARC	0.2 - 2 GeV ($\rightarrow$ 10 GeV?)	e, μ , π , K, p, p-bar	?? 2008 -
Tohoku STB	0.06 - 1.2 GeV	e, tagged- γ	Available now Users welcome



Updates since Durham (2004Sep)

- No testbeams available in 2006-2009 in Japan.
 - The testbeam at KEK PS will be possible until End of 2005.
 - The testbeam facility at KEK-linac failed to get funded. Hopeless.
 - The testbeam facility at J-PARC is not funded yet. Not available until 2010.
- ...however, we can go to DESY/CERN/FNAL where testbeams are available.

Tsukuba drift chambers now at DESY.

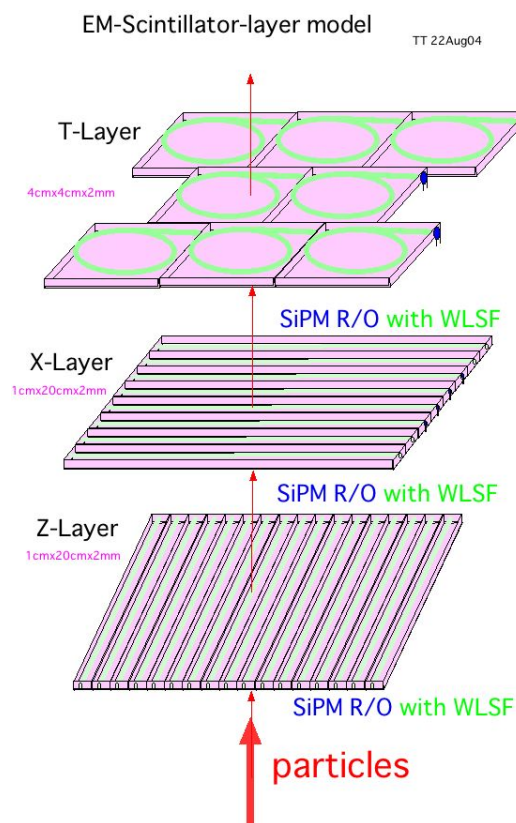
The drift chambers have been used for many beam tests at KEK, FNAL, and DESY.



- They are at DESY now.
 - Set up at ST21@DESY-II in February
 - Being used for CALICE Si-W ECAL
 - To be also used for CALICE AHCAL
- A small but good example of inter-regional cooperation

Scintillator-based Calorimeter

- Japan-Korea-Russia collaboration
- W+Sci with SiPM analog readout for ECAL
- Pb(Fe)+Sci with SiPM digital (or semi-digital) readout for HCAL
- Talks at this workshop
 - H. Miyata on scintillator and photon sensors
 - T. Takeshita on readout electronics
 - H. Matsunaga on simulation work
 - D. Kim on Korean R&D activities (just started)





Possible schedule (still very preliminary)

- 2004-2005
 - Design optimization
 - R&D of detector components
- 2005-2006
 - Construction of an **ECAL** test module
 - Tests with Cosmic-rays
- 2006 and onward
 - ECAL test at DESY
 - Combined beam test at FNAL

Beam Test Plan of Si/W EM Calorimeter Prototype-II



IL H. PARK (Ewha W. U.)

on behalf of

Ewha Womans University: S.J. Baek, H.J. Hyun, A.L. Jeong, S.W. Nam, I.H. Park, J. Yang

Korea University: J.S. Kang, S.K. Park, J.H. Choi

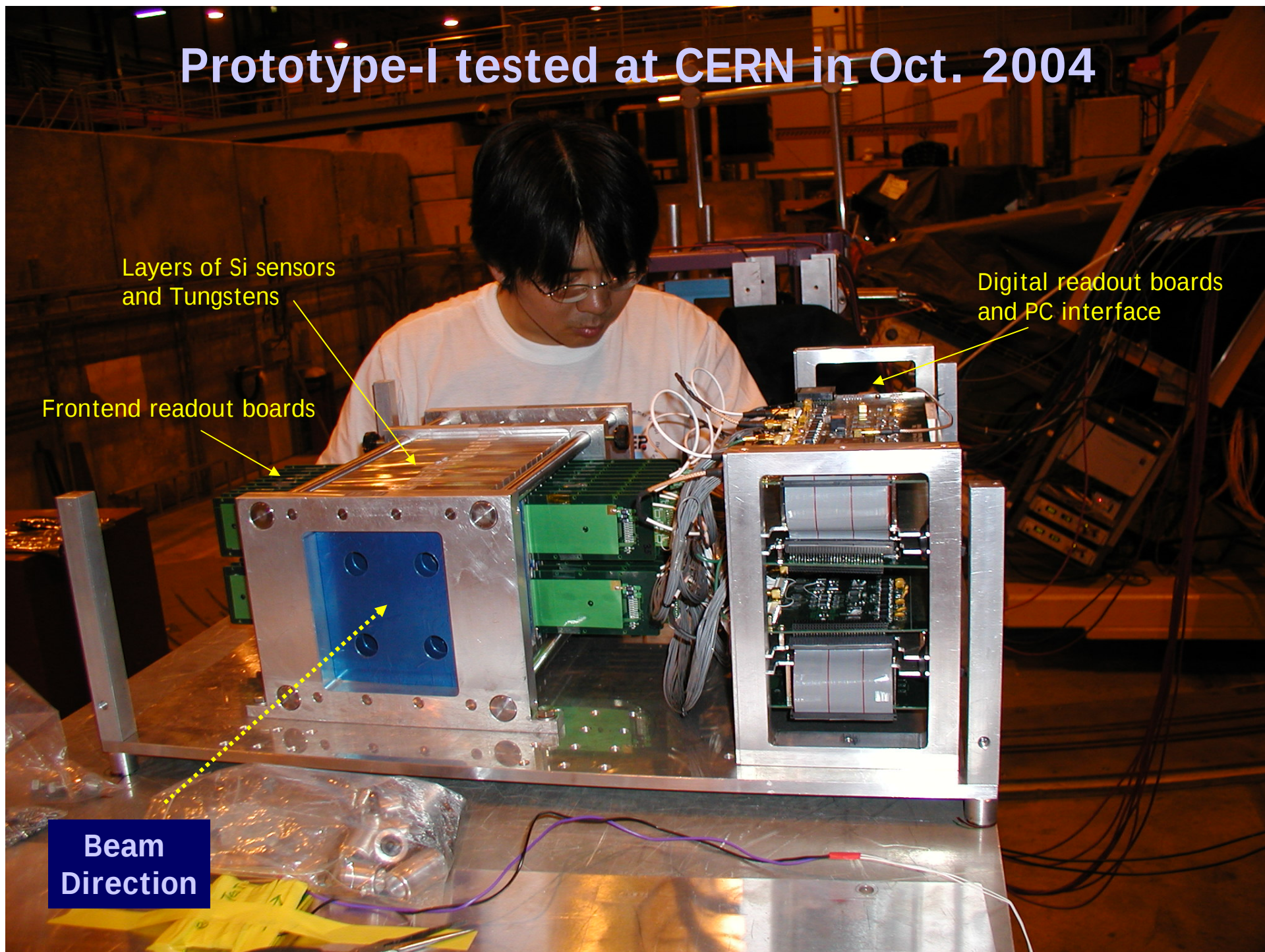
Kyungpook National University: Y.D. Oh, K.H. Han, D.H. Kim, J.S. Seo, U.C. Yang

Sungkyunkwan University: I.T. Yu, Y.P. Yu

Yonsei University: B.S. Jang, S.H. Jeong, J.H. Kang, Y.J. Kwon

1. AC type Sensor R&D :
2. New Frontend Chip
3. New Mechanical Design to reduce the thickness of the module

Prototype-I tested at CERN in Oct. 2004



Layers of Si sensors
and Tungstens

Digital readout boards
and PC interface

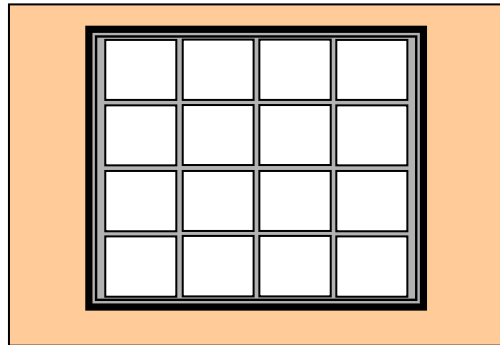
Frontend readout boards

Beam
Direction

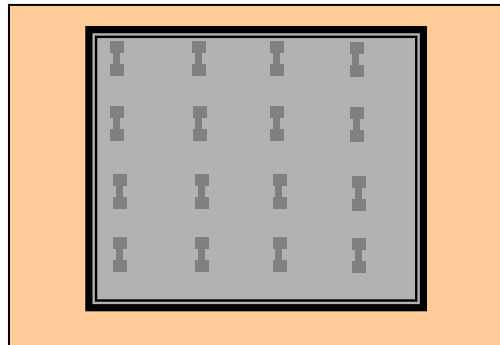
Prototype-II Si Sensor : AC type

Resistor : Polysilicon 10um*100um (1Mohm), **Capacitance** : Oxide 2cm²*6000A(1nF)

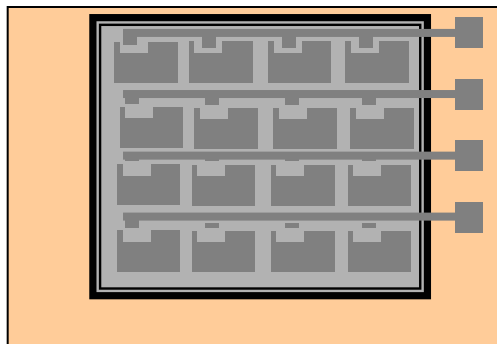
P+ Active mask



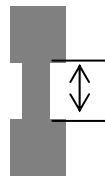
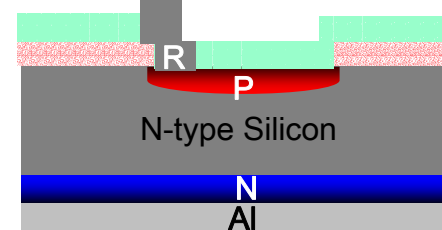
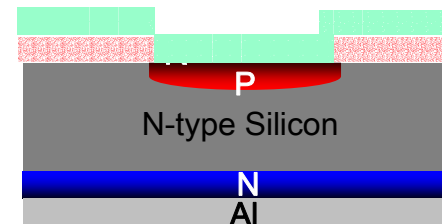
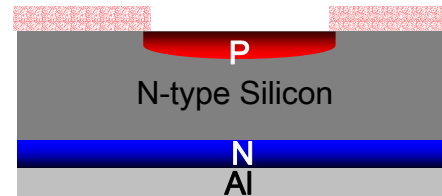
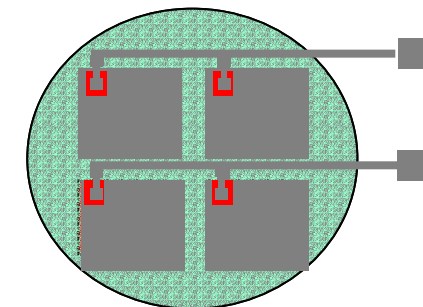
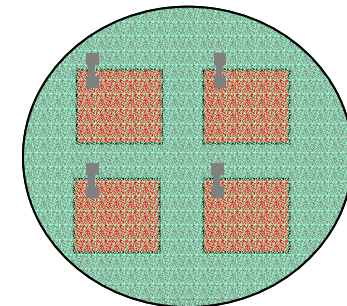
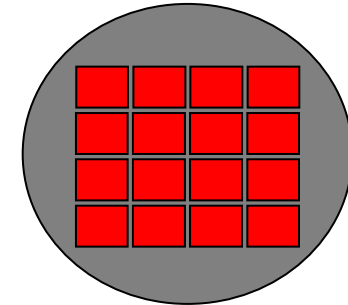
Resistor MASK



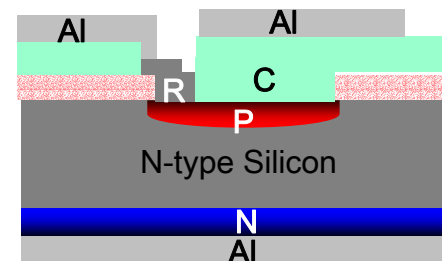
Metal MASK



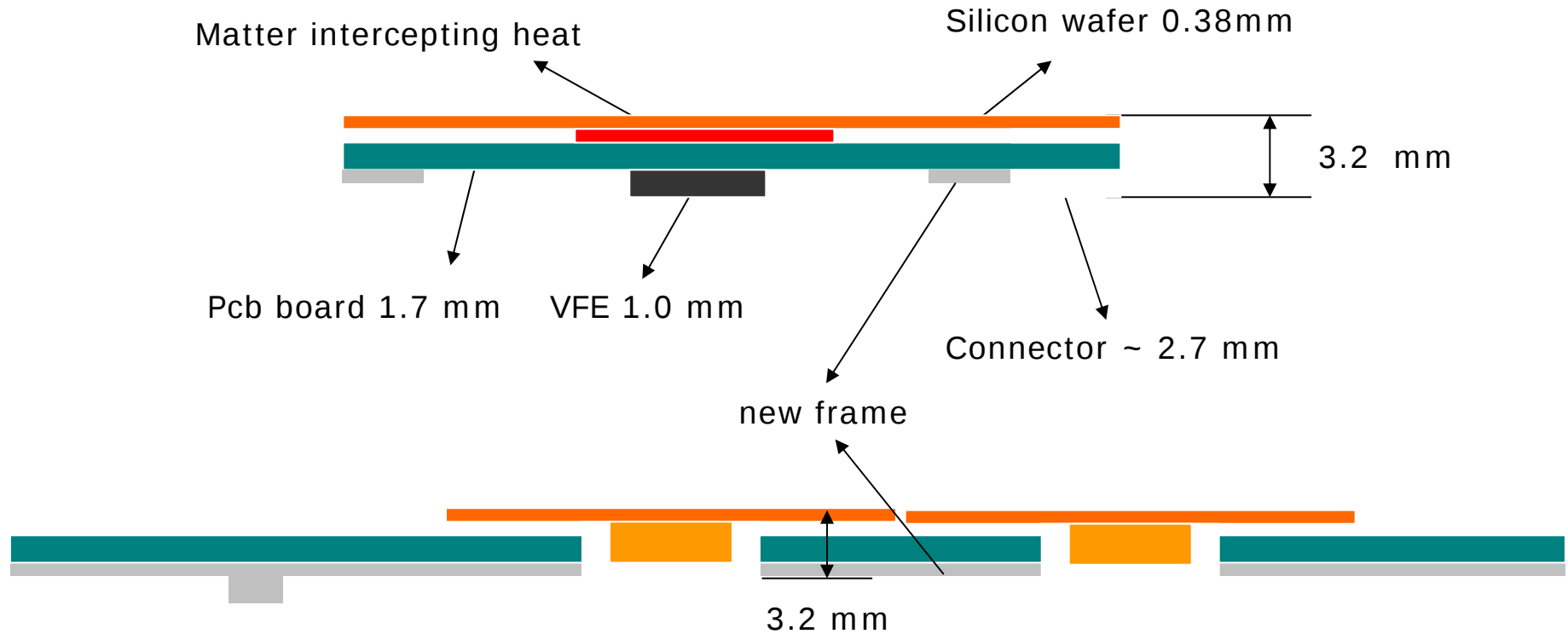
MASK Design



10um*100um

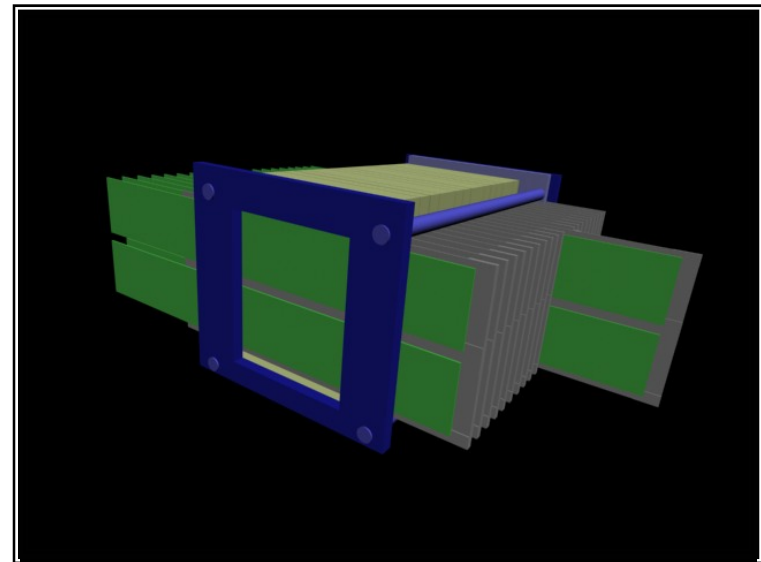
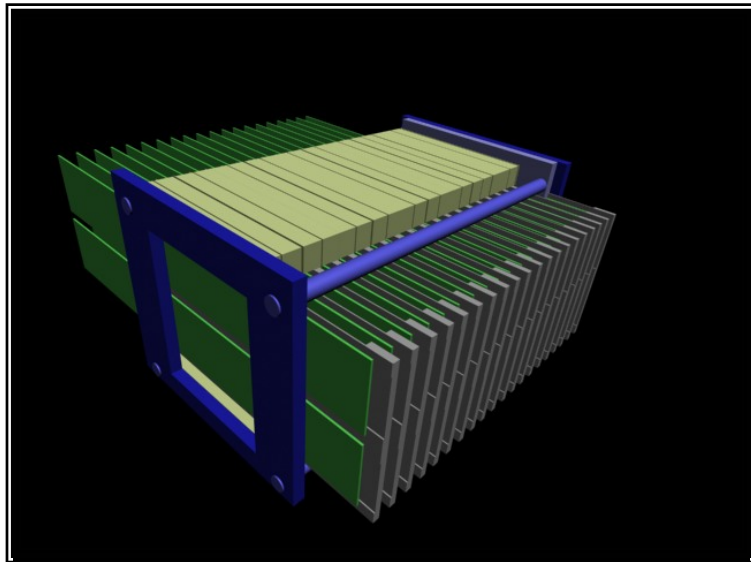
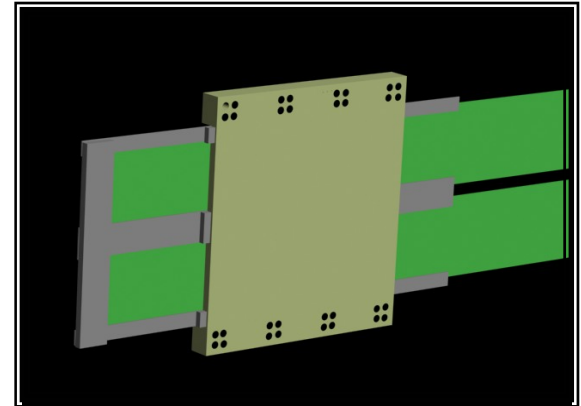
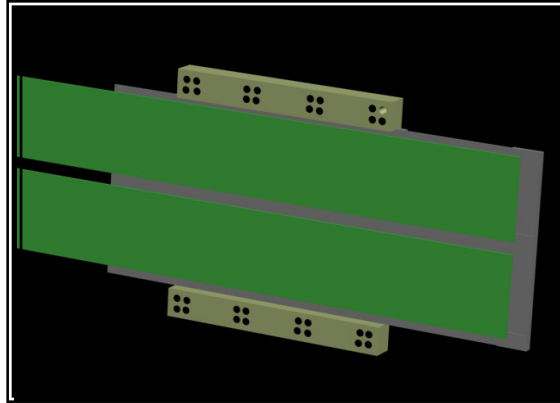
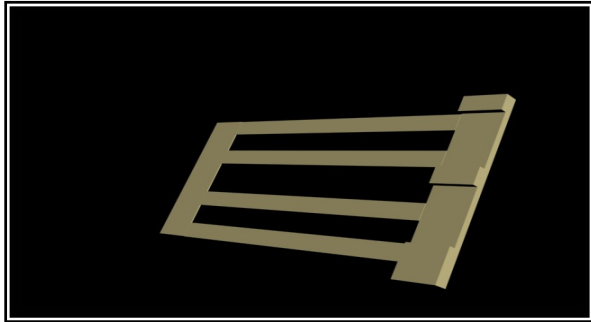


Design of Prototype-II Module



	SiCal Prototype I	SiCal Prototype II
Aluminum	1.5 mm	0.5 mm
Sensor and electric	10 mm	3.2 mm
Tungsten	3.5 mm	3.5 mm
total	15 mm	7.2 mm

Design of Prototype-II Support Structure



Plan of Beam Test

- Si-W Prototype for LC was built and exposed to the CERN beams in Oct. 2004
 - We built entire readout electronics, mechanical support and DAQ system
 - Results are presented in LCWS2005 (S. Nam)
- Prototype-II design is in progress
 - Currently the height of 1 layer detector is 1.5 cm, but factor two reduction foreseen including sensors, analog electronics, tungsten and support frame
 - Cooling may be done with “micro-cooling chip” on top of the analog chip
- We plan to do test beam in 2005, whenever available at Fermi lab
- We plan to do beam test in Oct., 2006 at CERN



Summary

- No hope to test our calorimeter prototypes in Japan.
- Tsukuba drift chambers working well at DESY (inter-regional collaboration)
- We have plans of testbeam studies
 - Scintillator-based ECAL (Japan-Korea-Russia) at DESY/FNAL
 - SiW ECAL (Korea) at FNAL/CERN