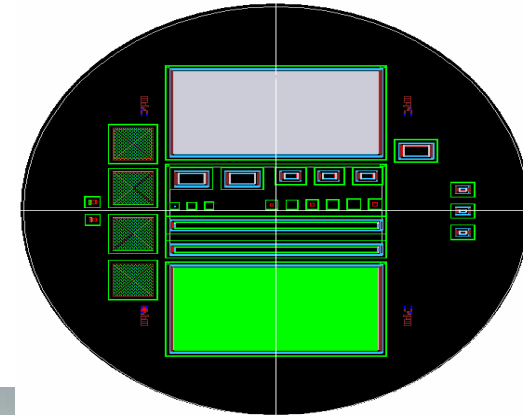


Silicon Inner Tracker R&D Status in Korea



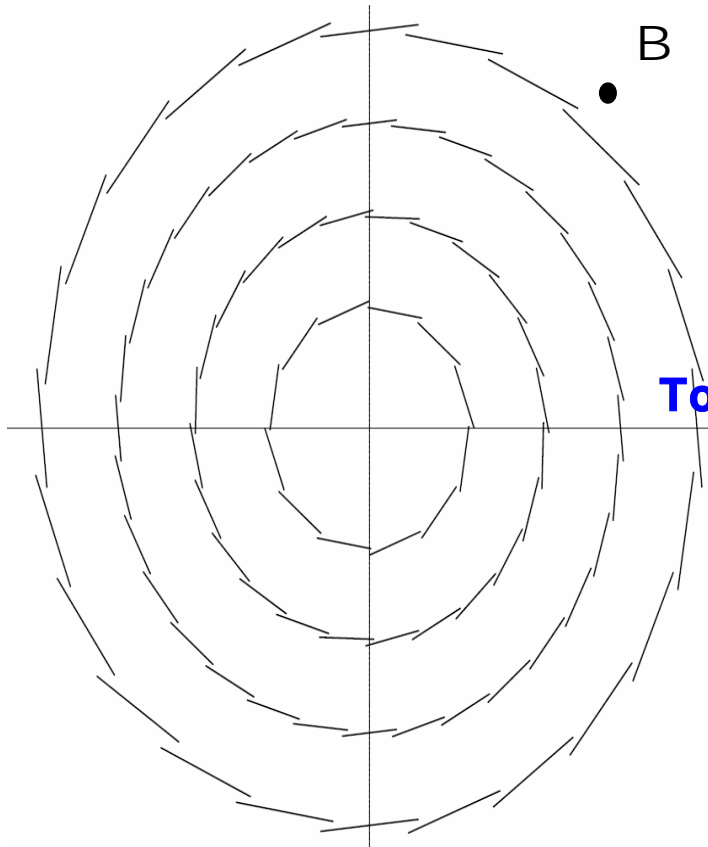
- Introduction
- Silicon Inner Tracker (SIT) in GLD
 - Barrel Inner Tracker (BIT)
 - Forward Inner Tracker (FIT)
- Sensor Test
- Summary



H. Park (Kyungpook Nat'l Univ.)

LCWS2006 at Bangalore

Barrel Inner Tracker Configuration

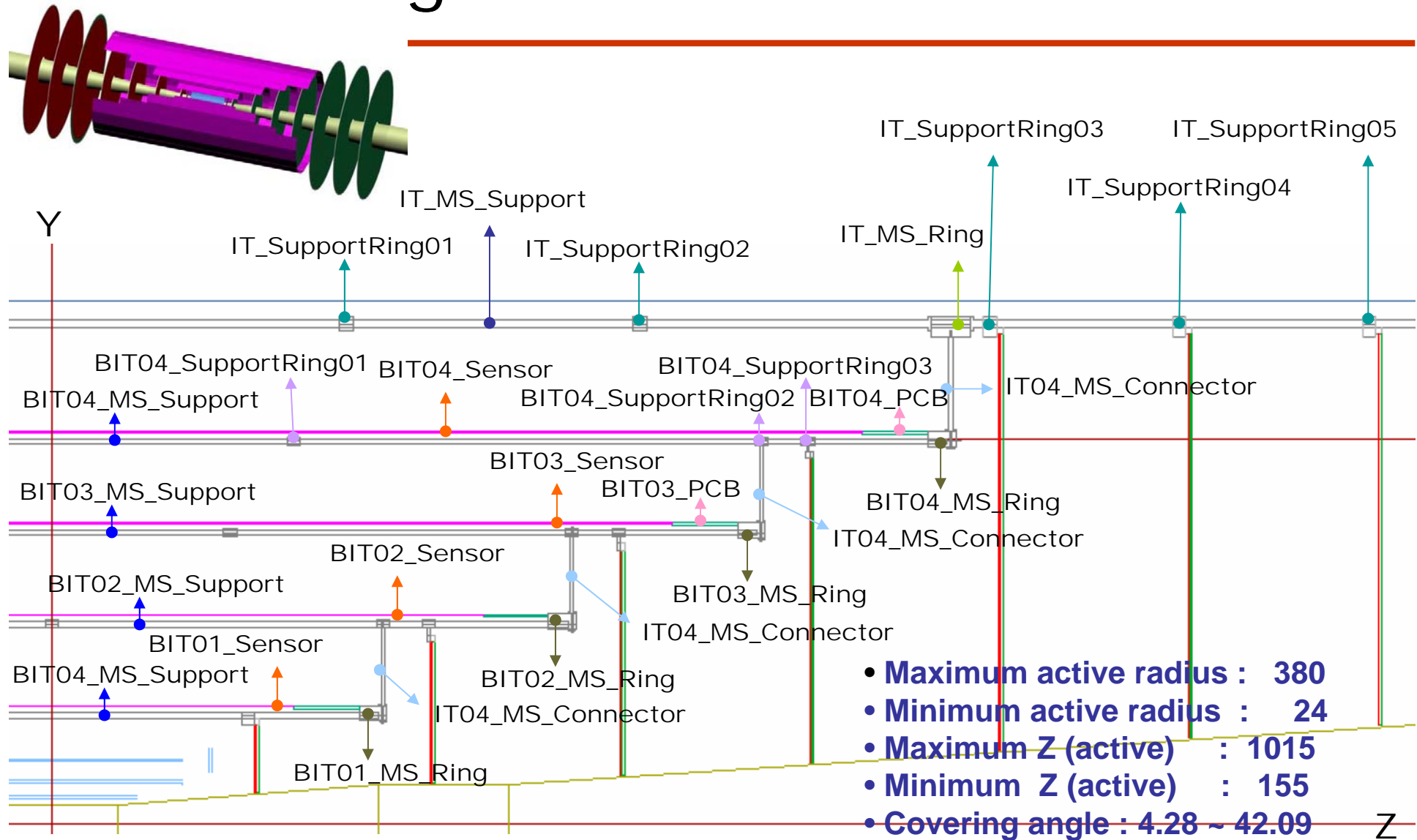


BIT	Half Z	Real Z (o 1.6 mm)	R	sensor type	
layer 1	185	195.2	90	50 X 50	5.76°
layer 2	330	340.4	160	50 X 50	5.76°
layer 3	475	485.6	230	50 X 50	5.76°
layer 4	620	620.4	300	90 X 90	5.76°

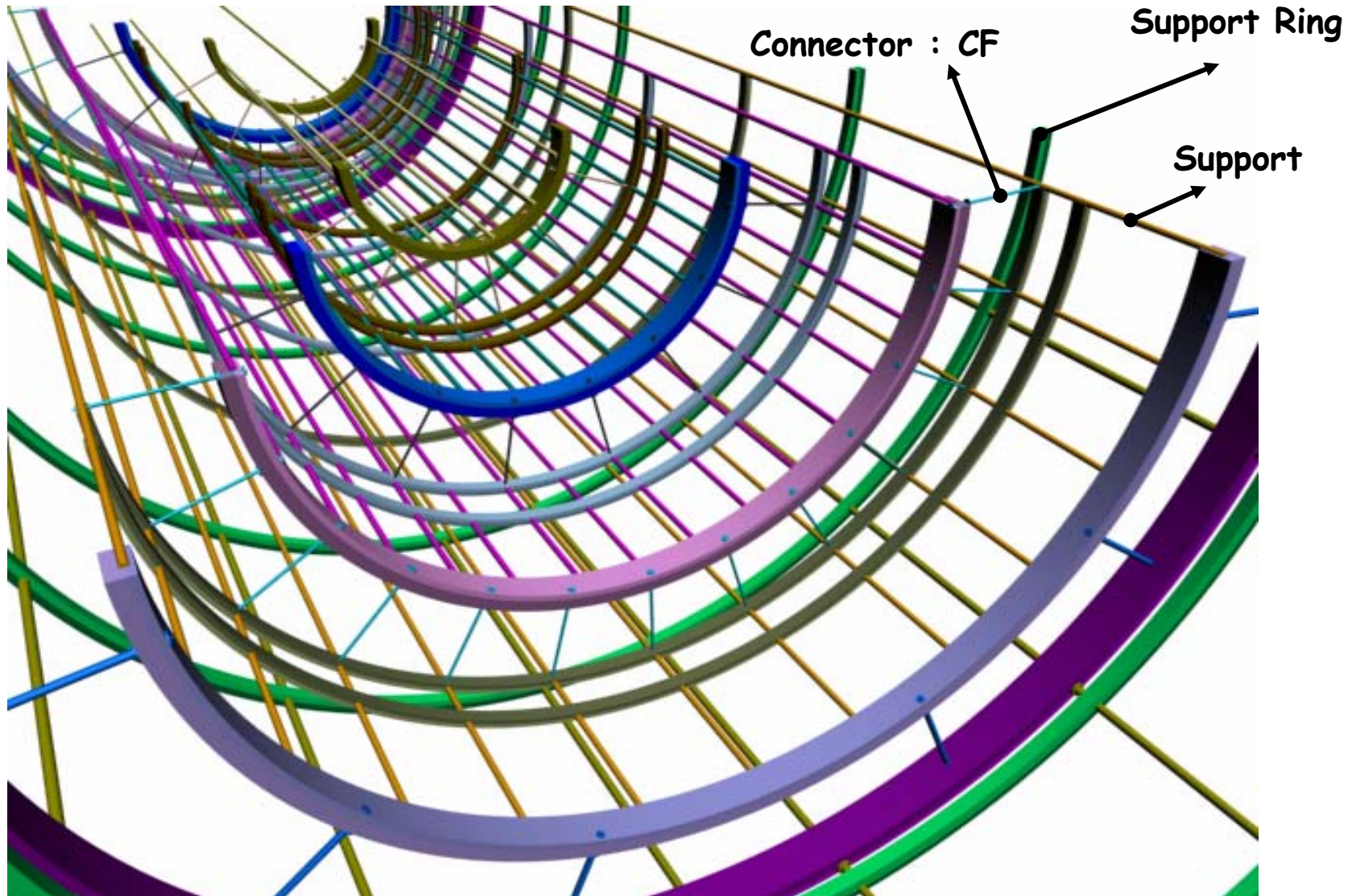
To make dead region free, module has 1.6 mm overlap

BIT	sensor area	# sensor of a module (o 1.6)	# module	# sensor	total area
layer 1	50 X 50	4	24	96	240000 MM ²
layer 2	50 X 50	7	48	336	840000 MM ²
layer 3	50 X 50	10	64	640	1600000 MM ²
layer 4	90 X 90	7	24	168	1360800 MM ²

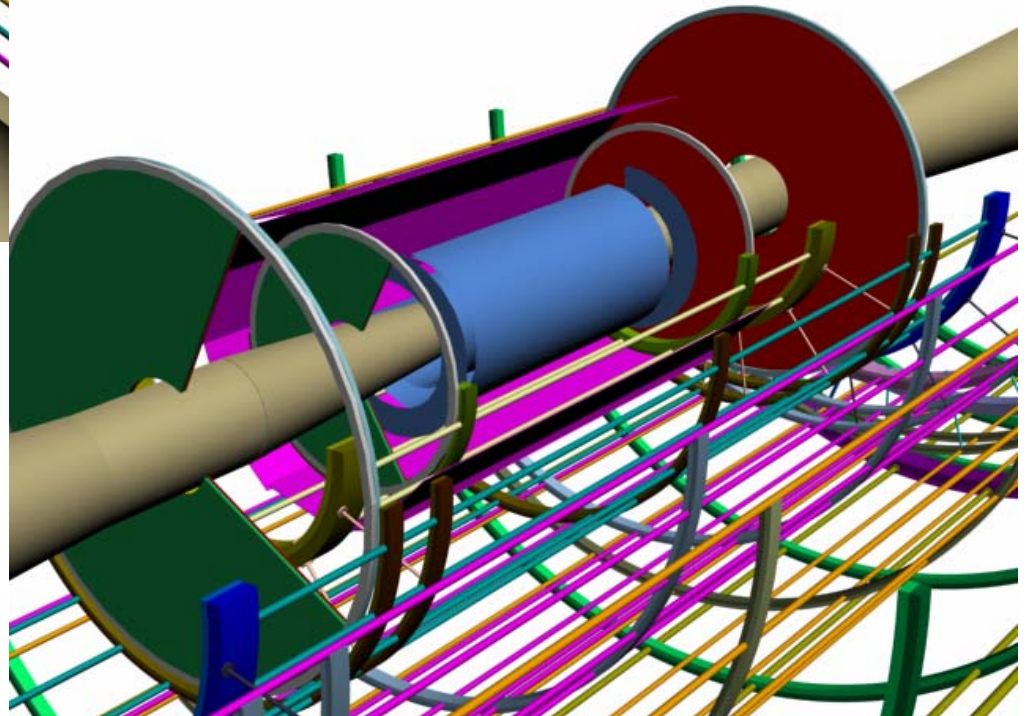
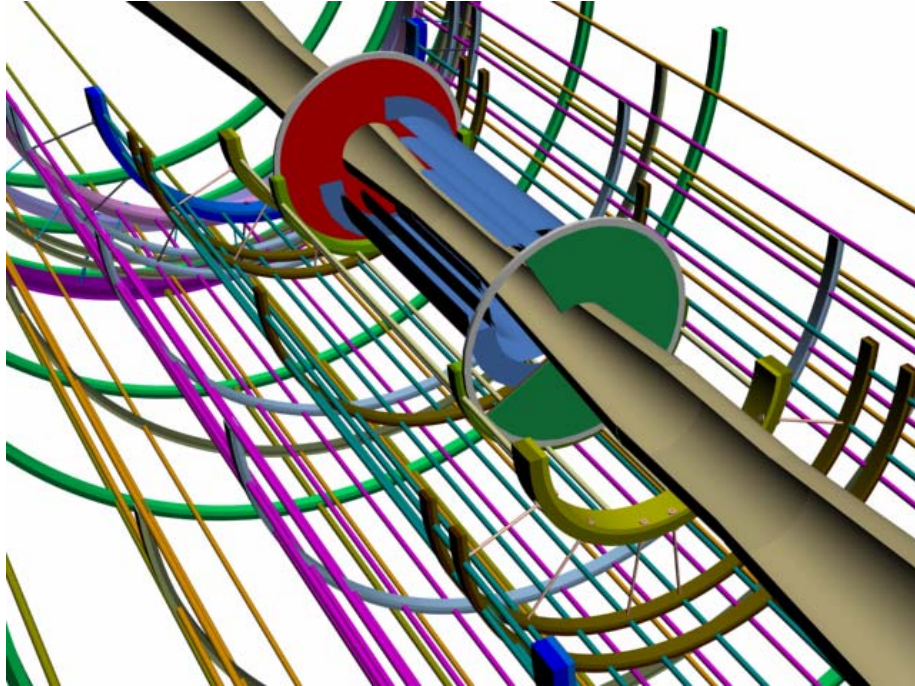
Configuration of BIT and FIT



SIT Mechanical Structure

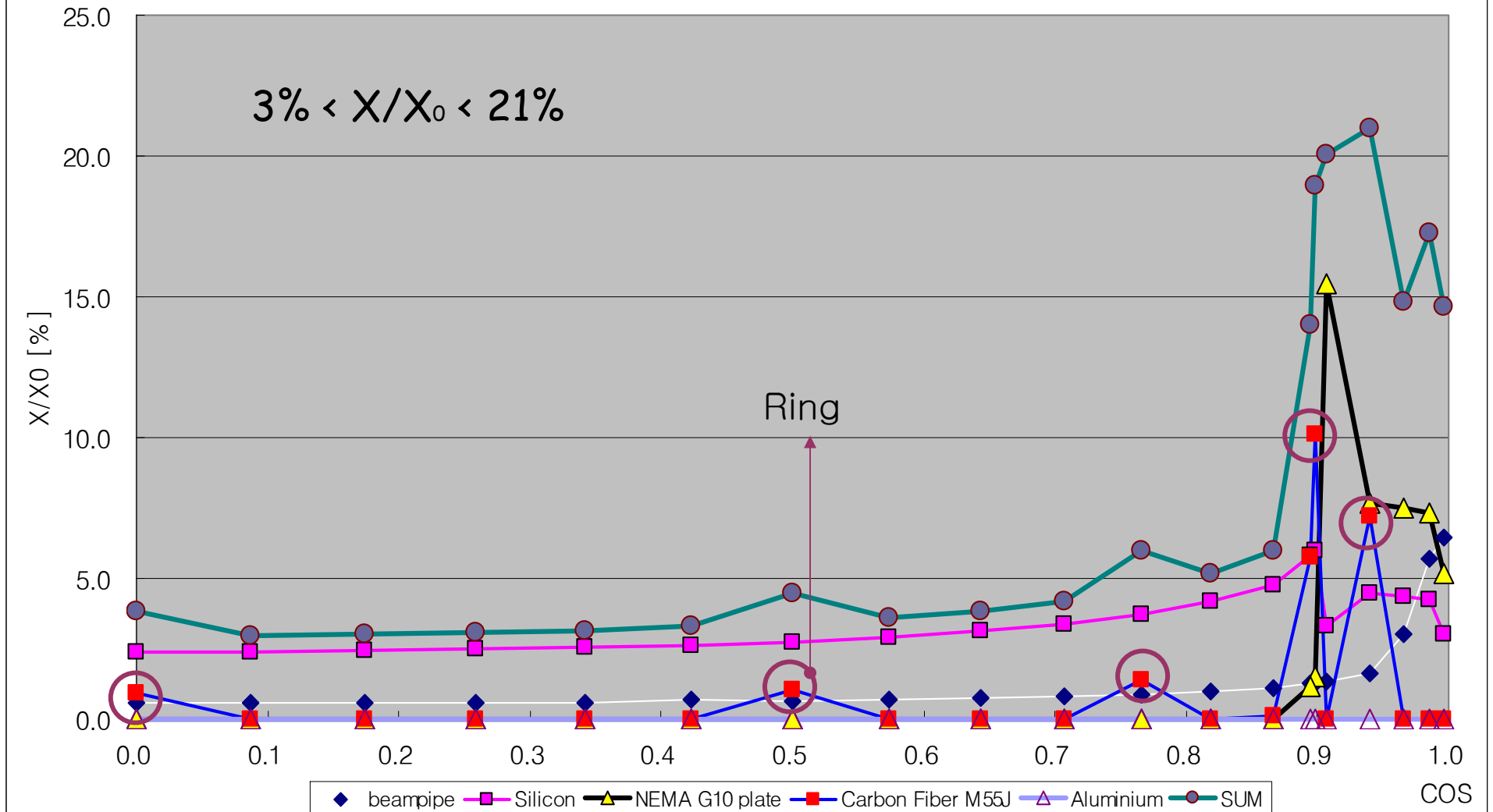


IT Mechanical Structure

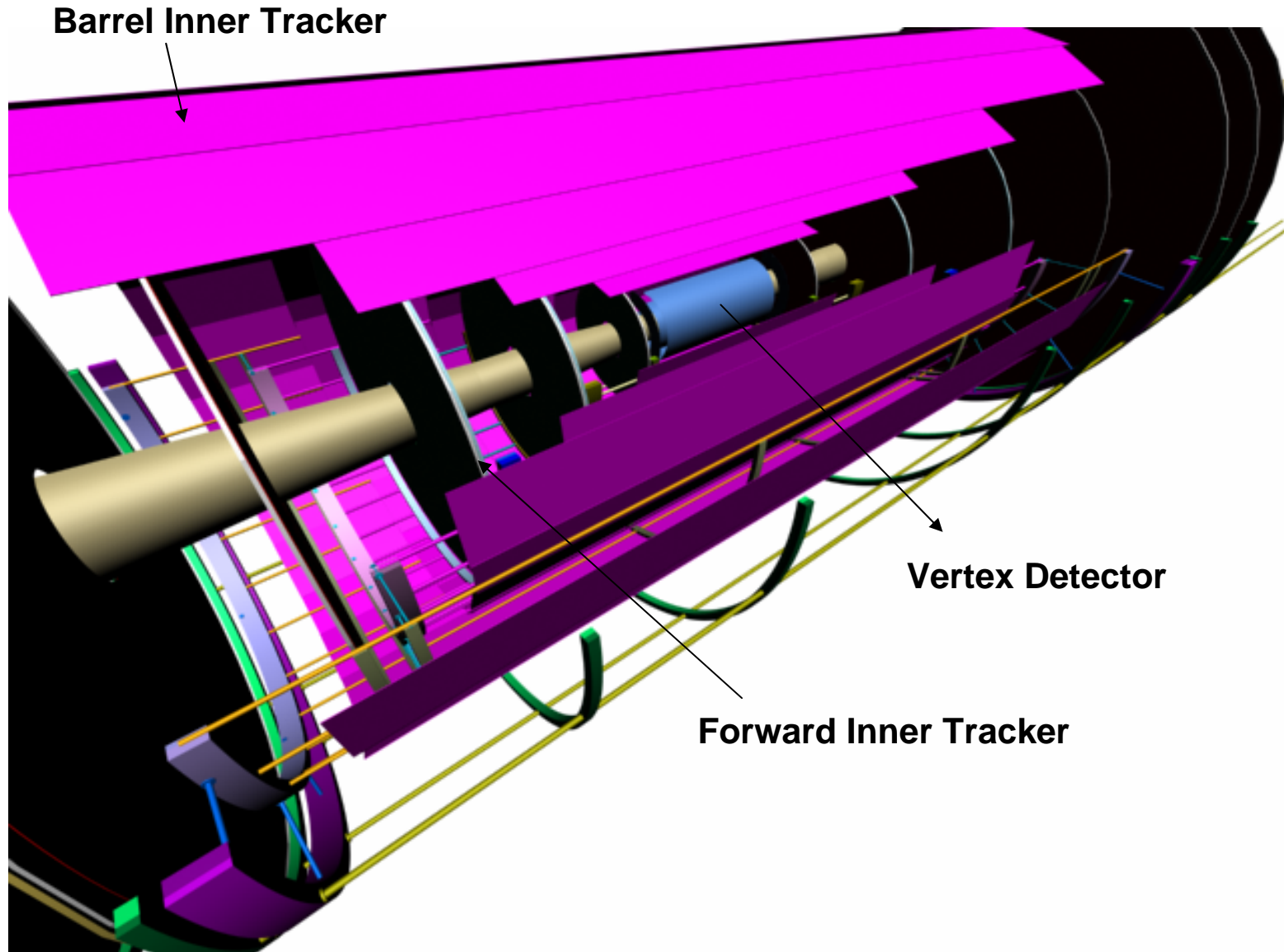


Material Budget

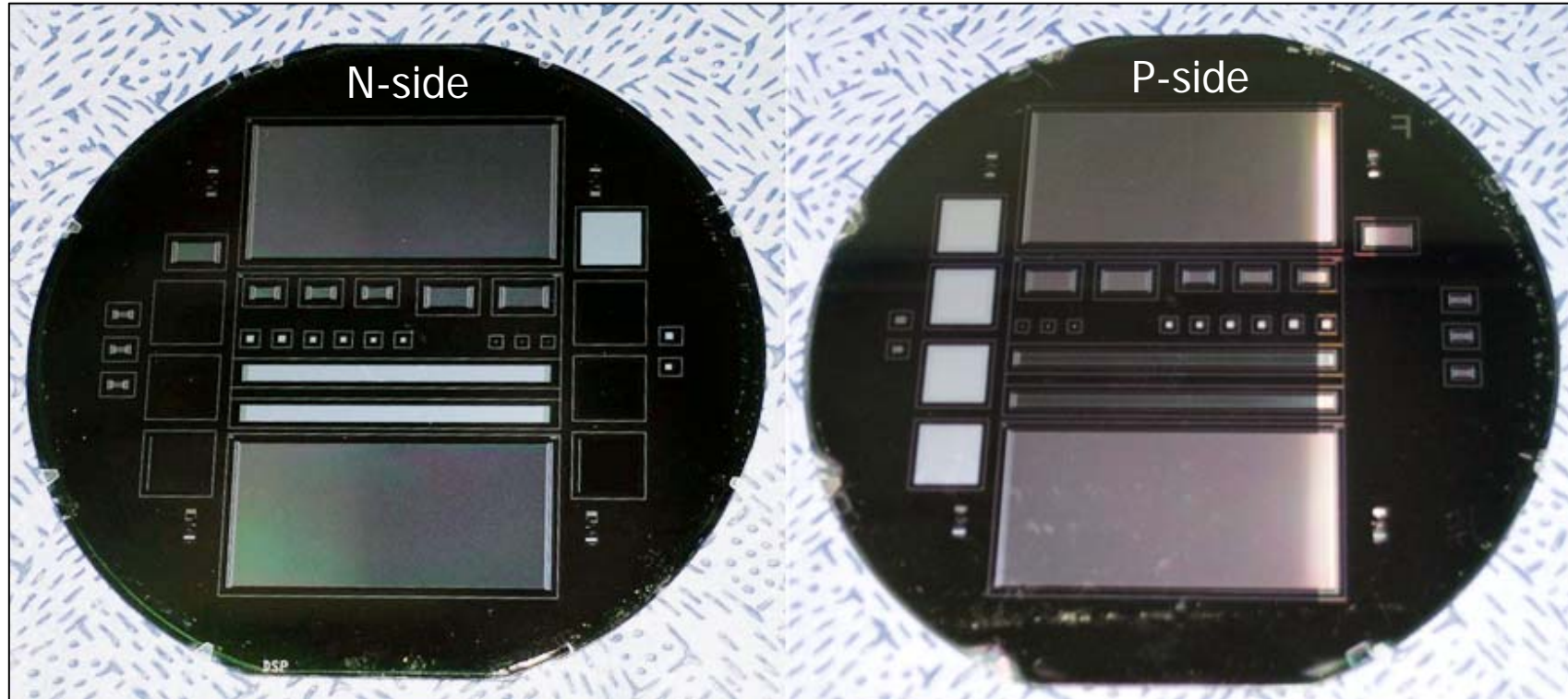
Material Budget – 5 degree



IT Mechanical Structure

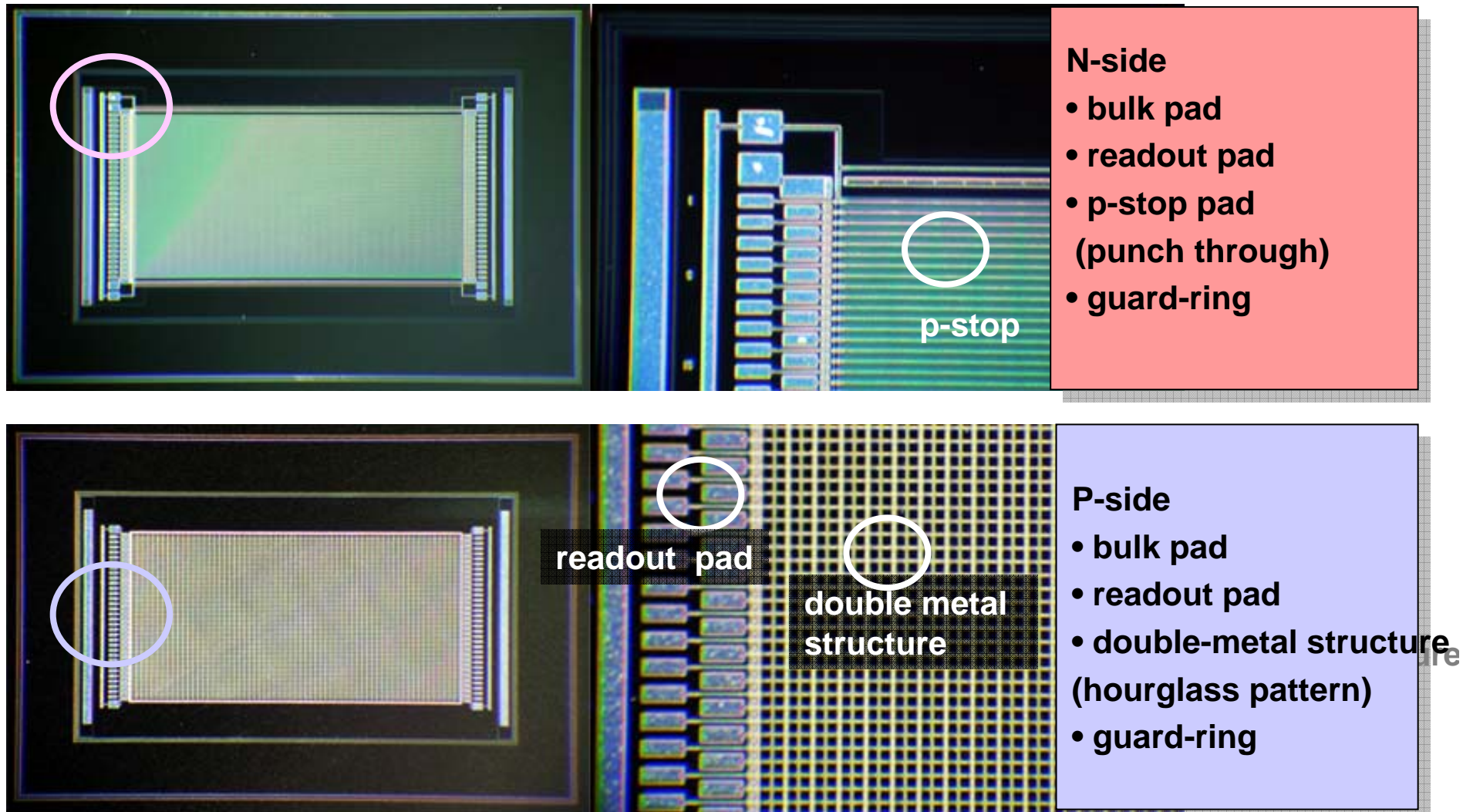


Prototype

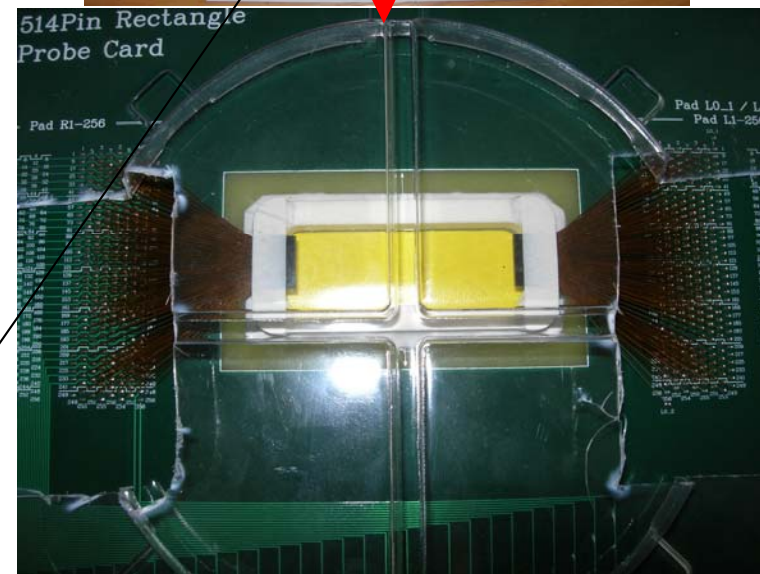
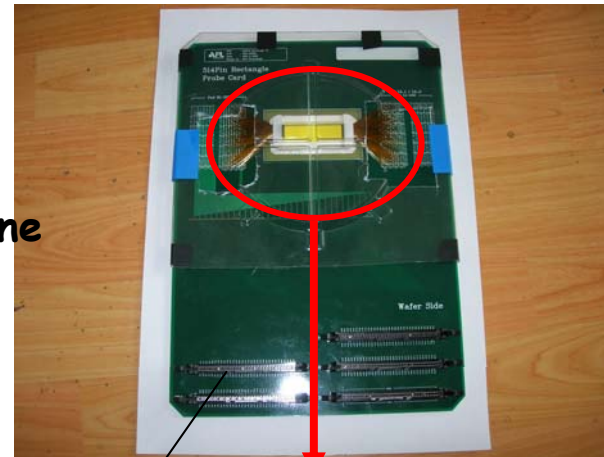
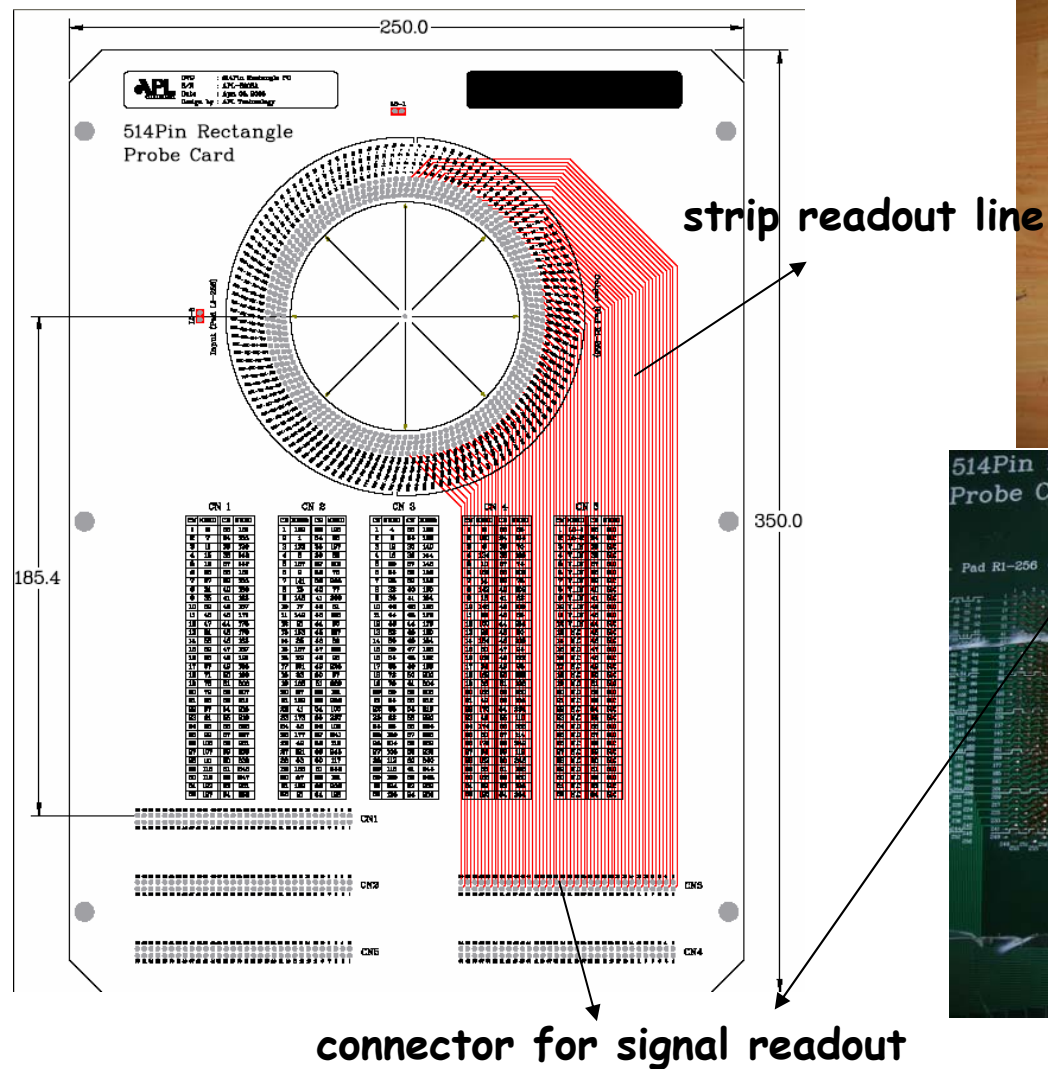


wafer	TOPSIL (5inch, high resistivity, (100), FZ, DSP)	strip width	9 μ m
		strip pitch	50(100) μ m
thickness	380 μ m	readout pitch	50 μ m
size	51 x 26 mm ²	readout channel	512(512)

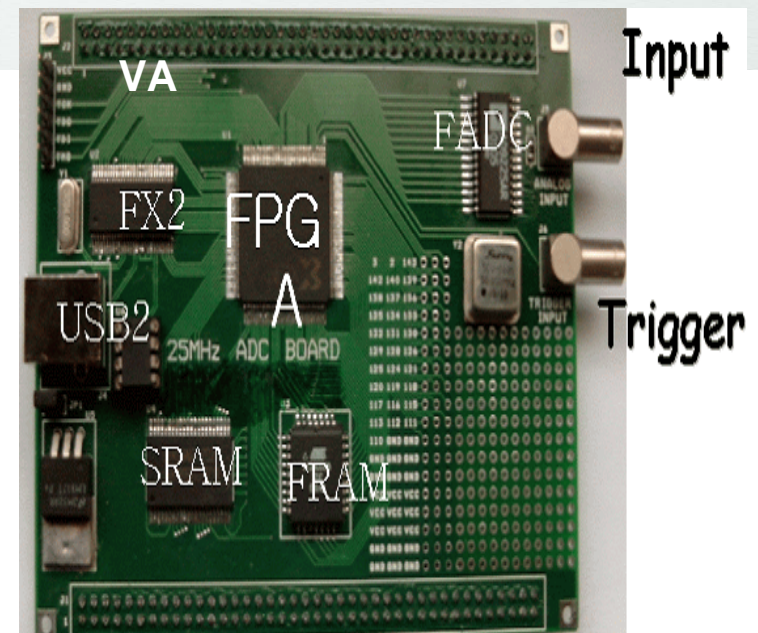
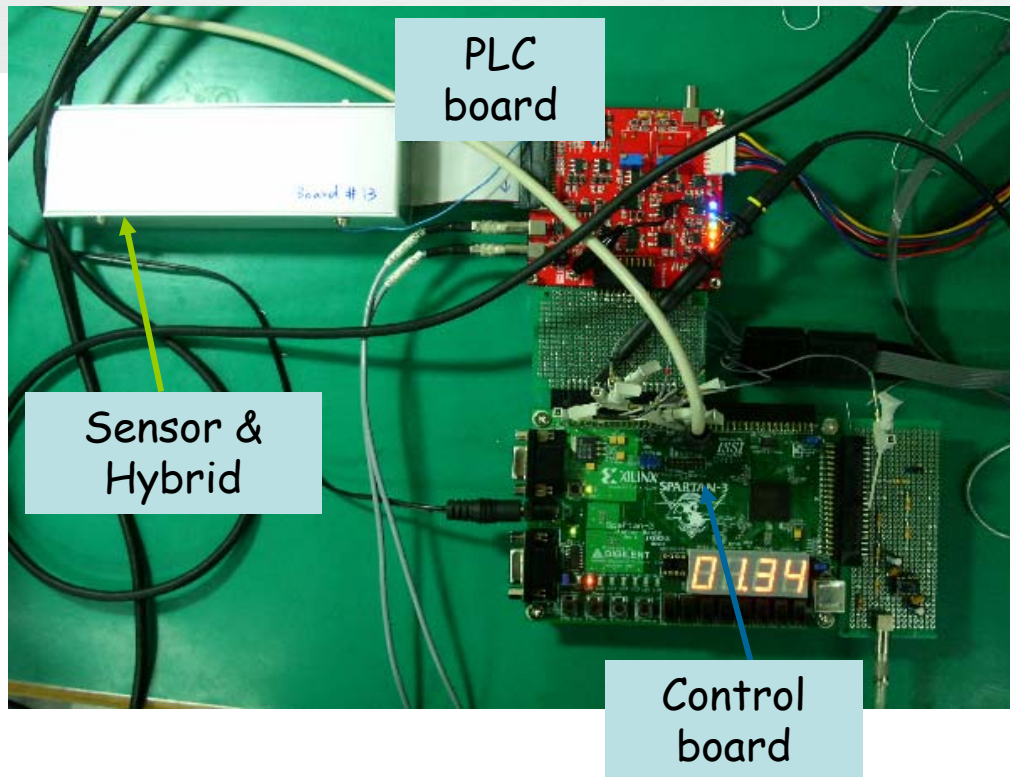
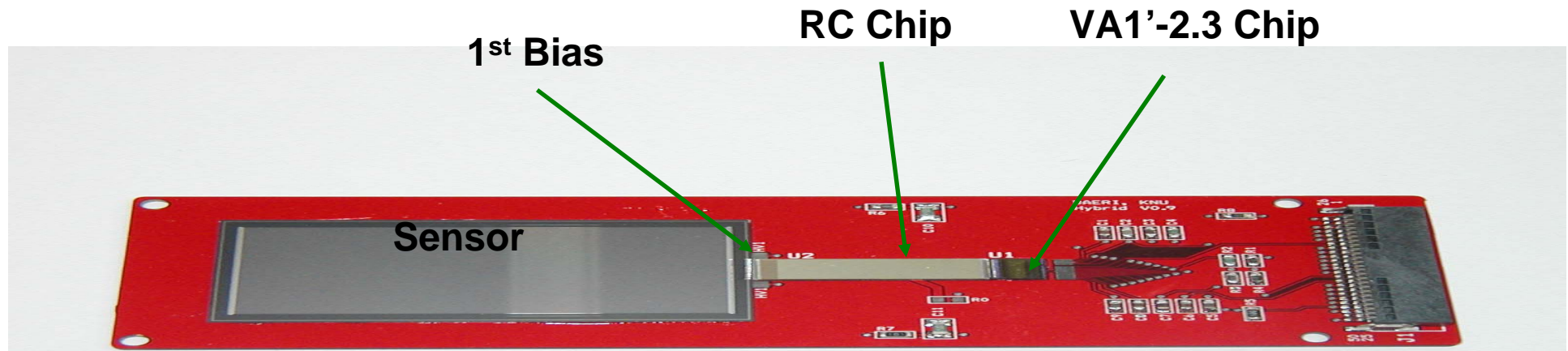
DDDS Prototype



Probe Card for Strip Measurement

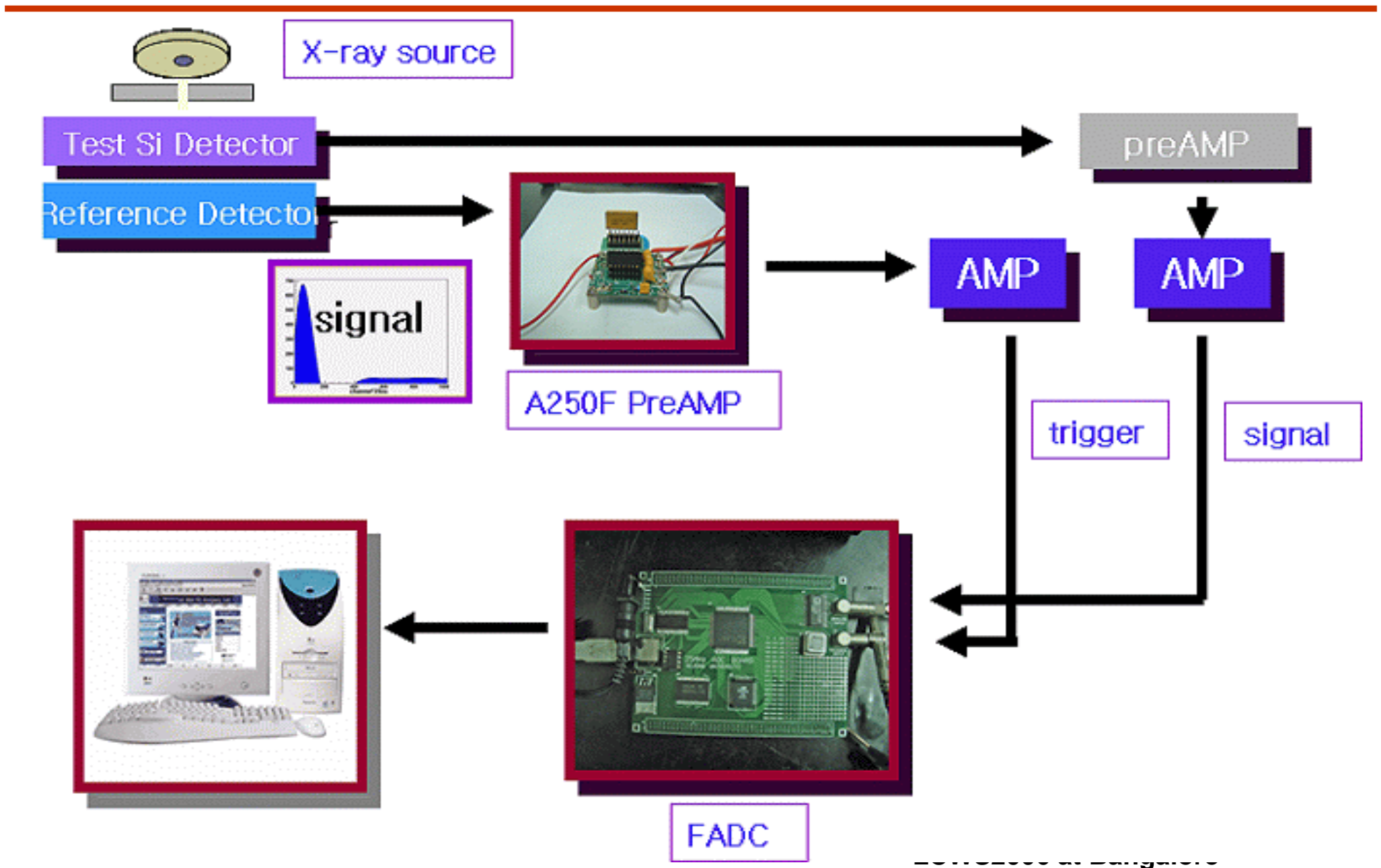


Sensor Signal Readout

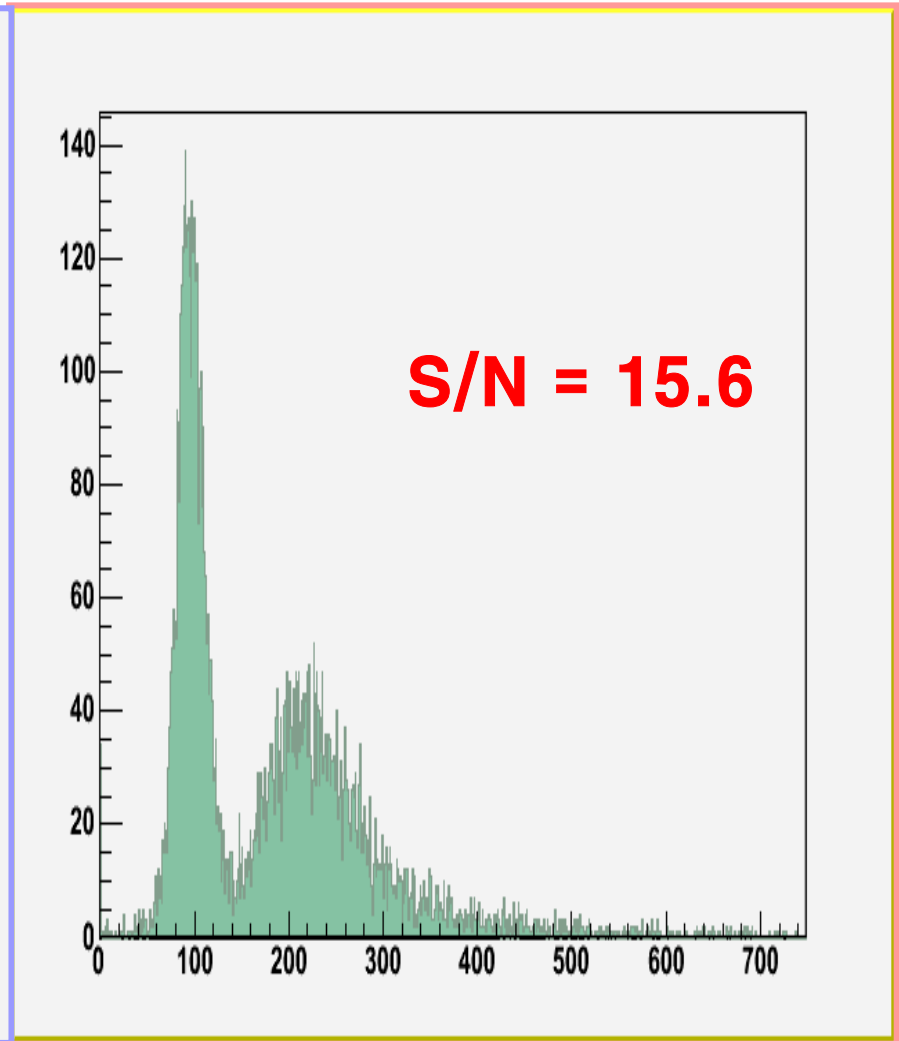
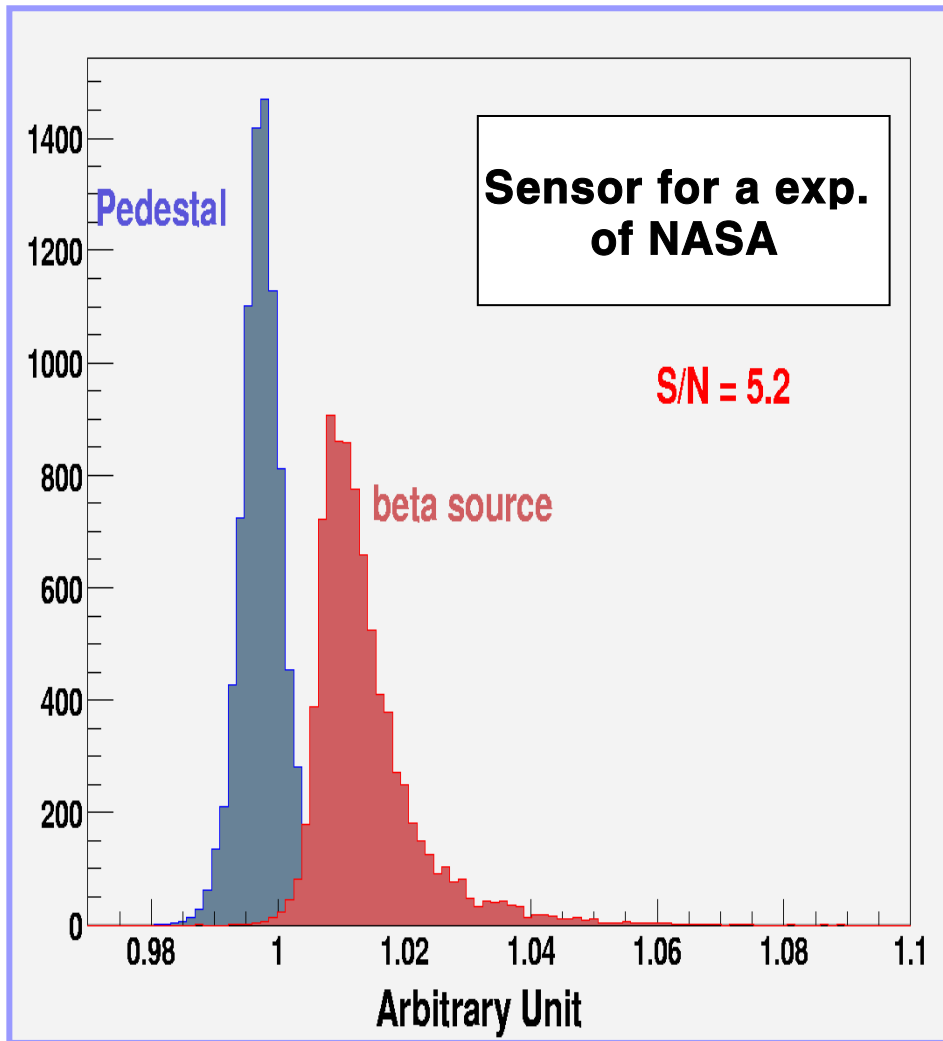


USB2 based 25MHz FADC
LCWS2006 at Bangalore

For S/N Measurement

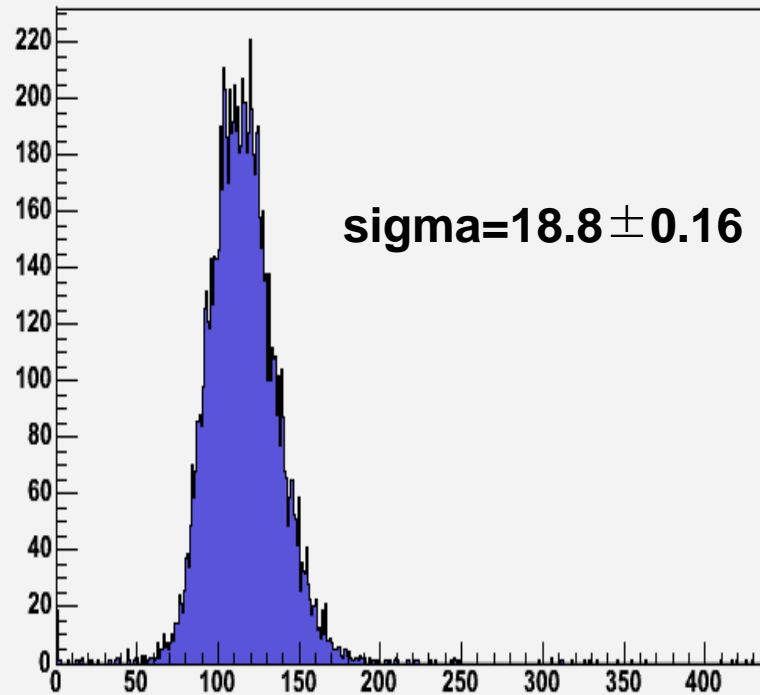


S/N Measurement Result



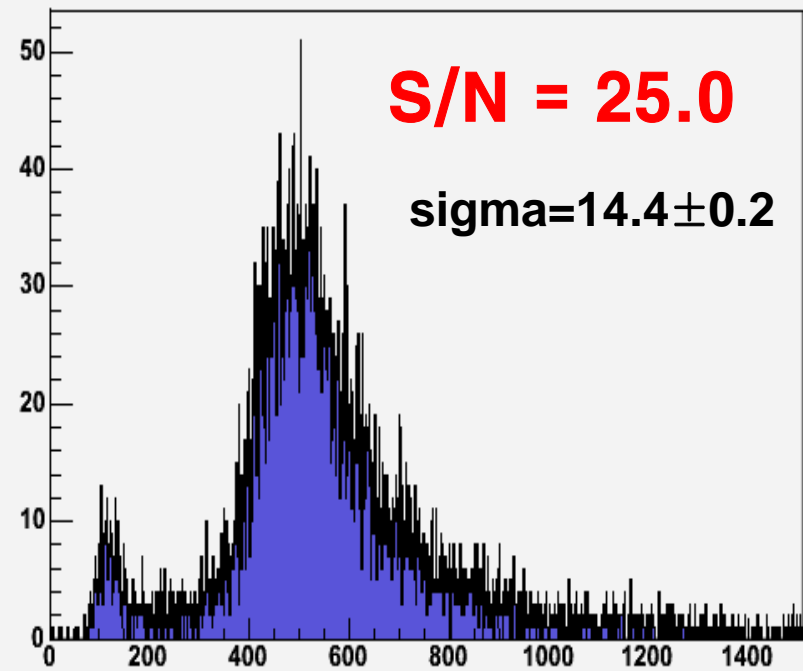
S/N Measurement Result

photodiode from H company



pedestal (HAMAMATSU Photodiode)

Developed DSSD

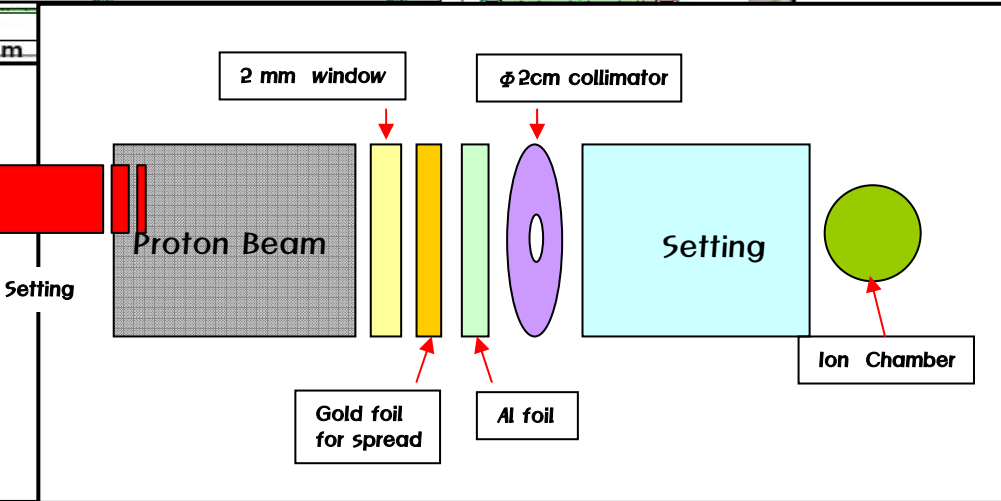
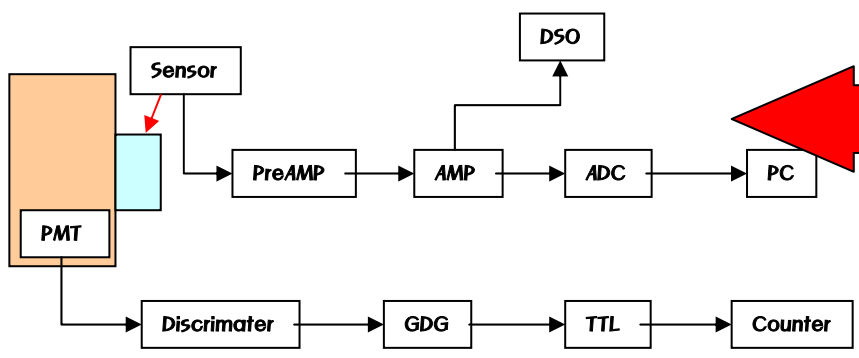
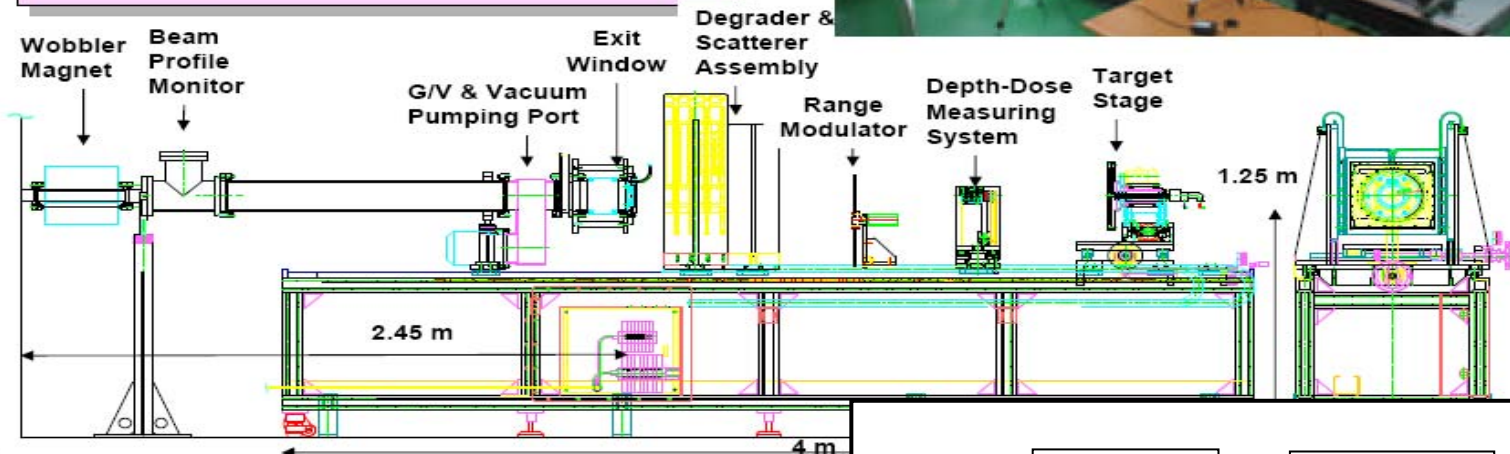


signal & pedestal (DSSD)

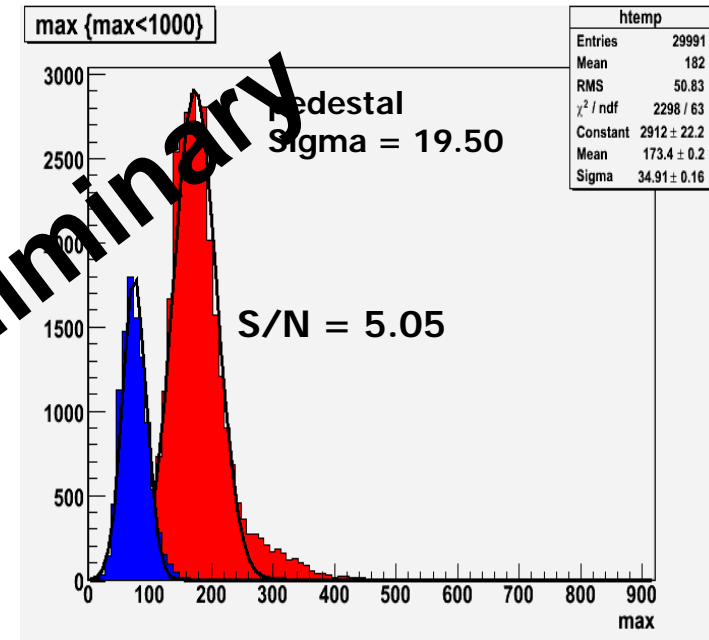
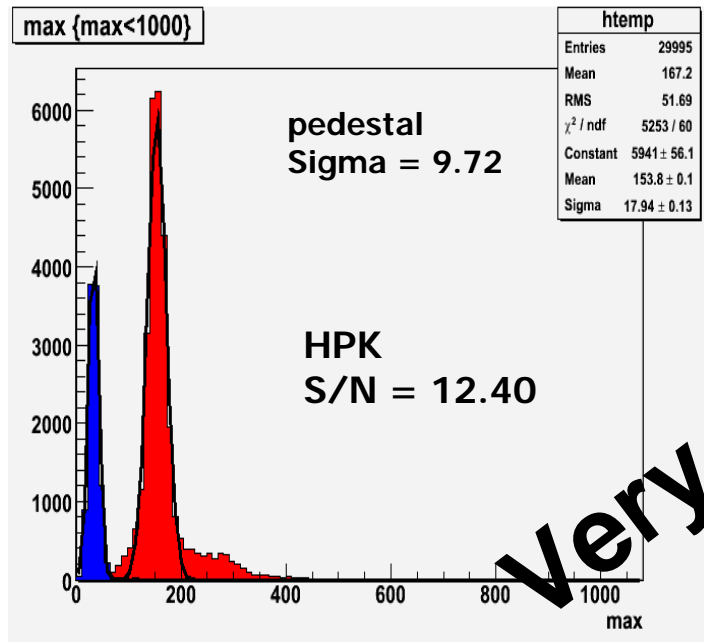
45MeV 저선량 양성자빔 시험이용시설

Proton Beam Test

- Energy Range : 10~38MeV for external beam
- Beam energy from cyclotron : 35 and 45MeV
- Flux Range : $1 \times 10^8 \sim 5 \times 10^{10} / \text{cm}^2 \cdot \text{sec}$
- Irradiation area : < 5cm diameter (>30cm)
- Irradiation Uniformity : > 90%
- Wobbler and spiral scanning are available
- Target Area : 20cm diameter with cooling
- Vacuum pressure : < 4×10^{-7} torr

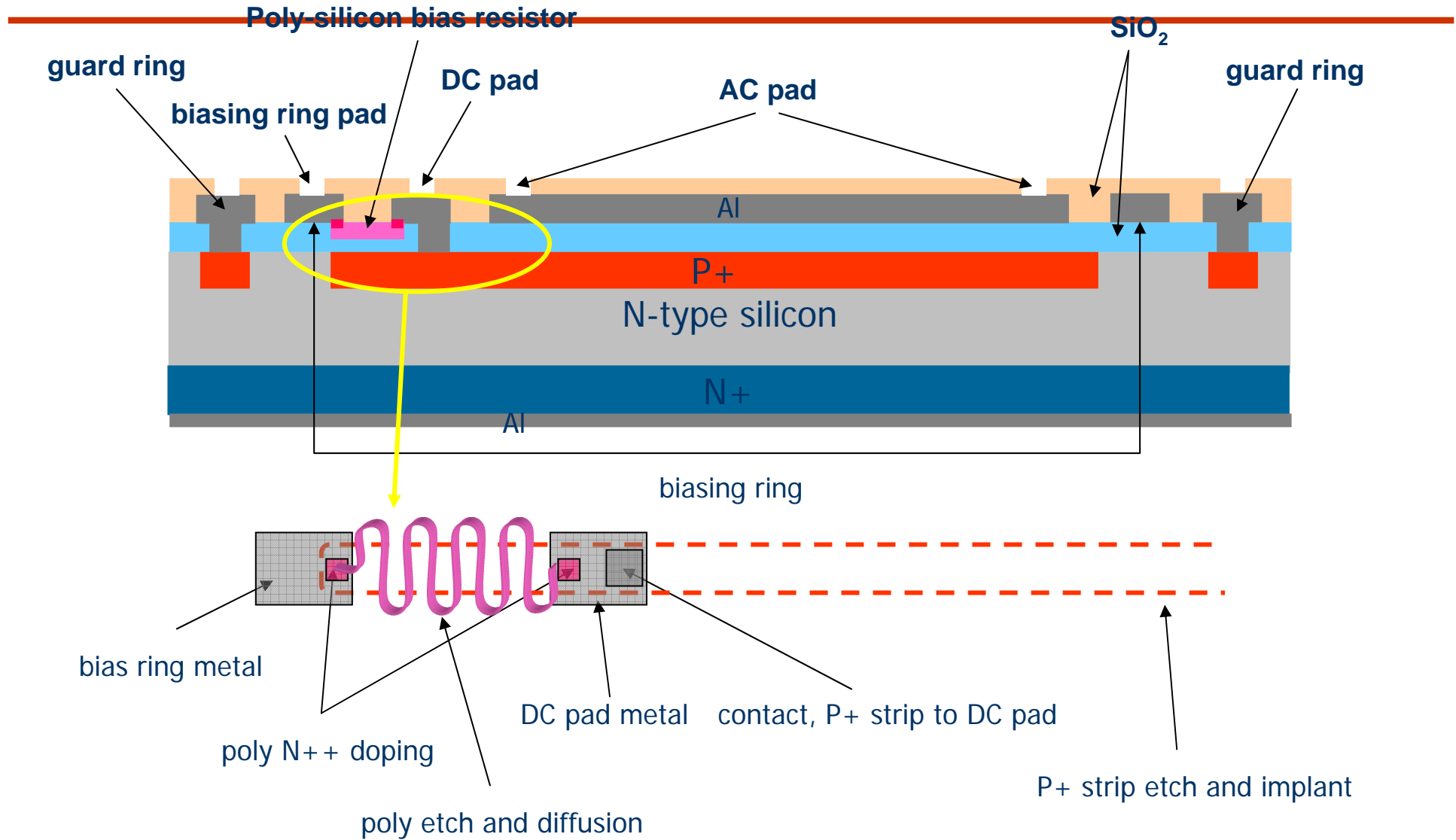


Proton Beam Test

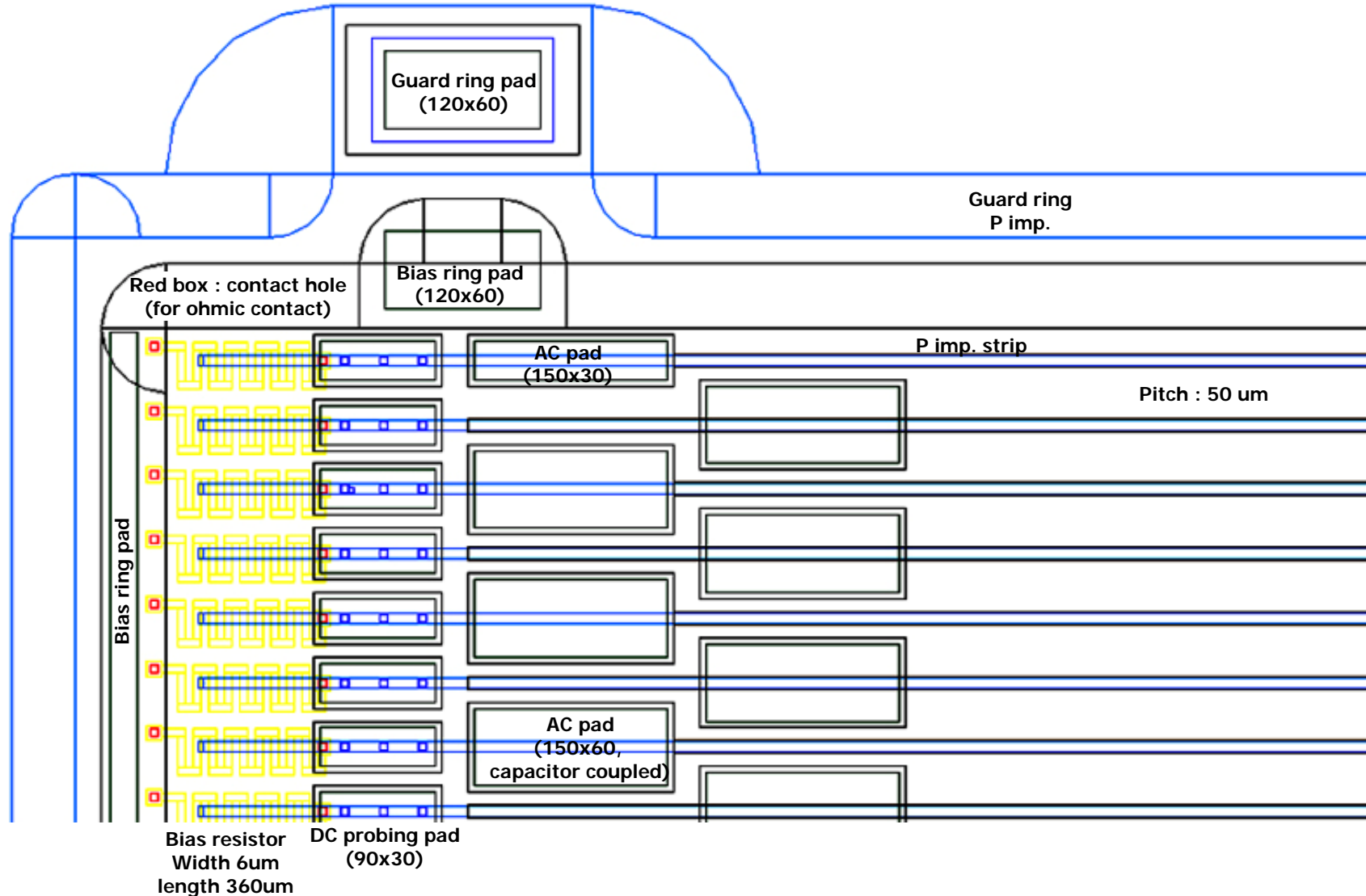


Very Preliminary

AC-Type SSSD



Mask Design of SSSD



Summary

- **Baseline design of silicon inner tracker**
 - ✓ 4 layers of barrel inner tracker with 1.6 mm overlap
 - ✓ 7 layers of forward inner tracker
 - ✓ mechanical structures of BIT and FIT
 - ✓ **readout electronics**
- **Sensor development and performance test**
 - ✓ sensor fabrication and test for DC-DSSD, DC-SSD, DC-PAD
 - ✓ **sensor on batch for AC-SSD in progress**