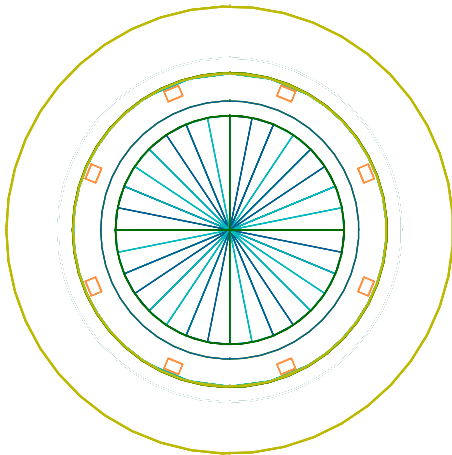


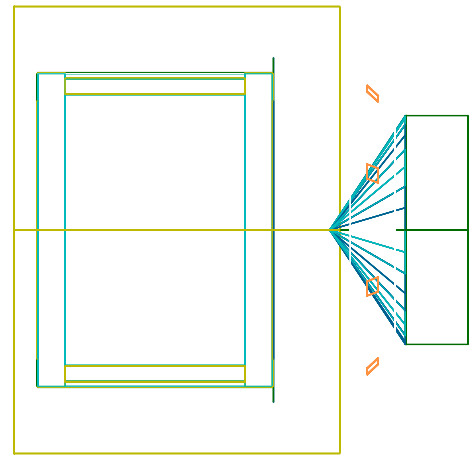
Latest GEANT4 Simulation and Foils Cost Estimation

GEANT4 Simulation : Geometry

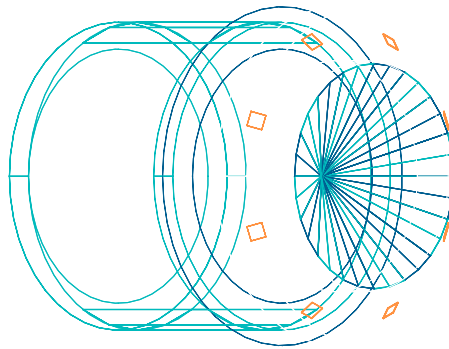
Upstream view



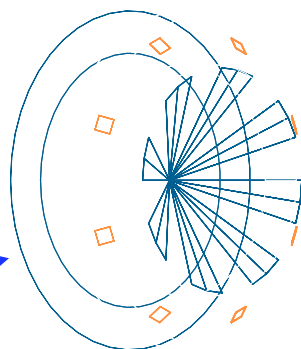
Side view



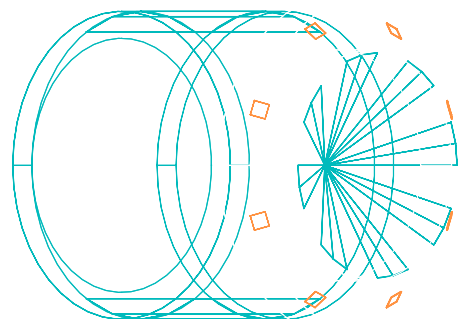
Foils and SDDs



Ti Foils



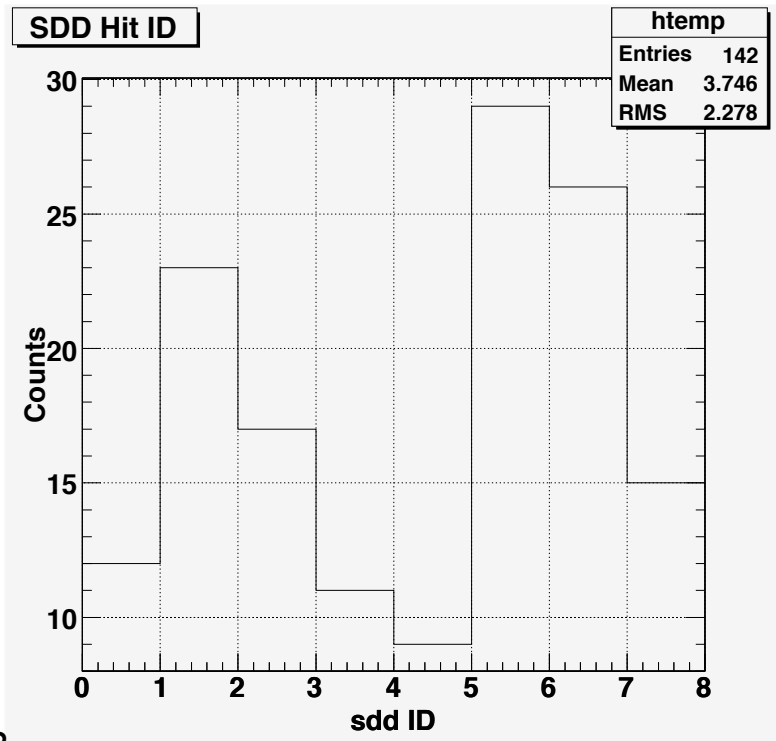
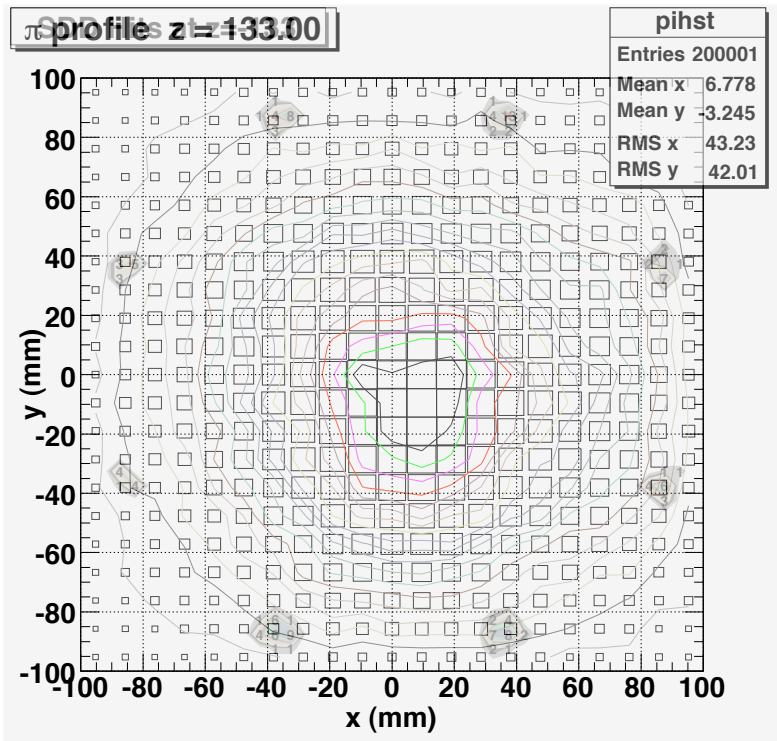
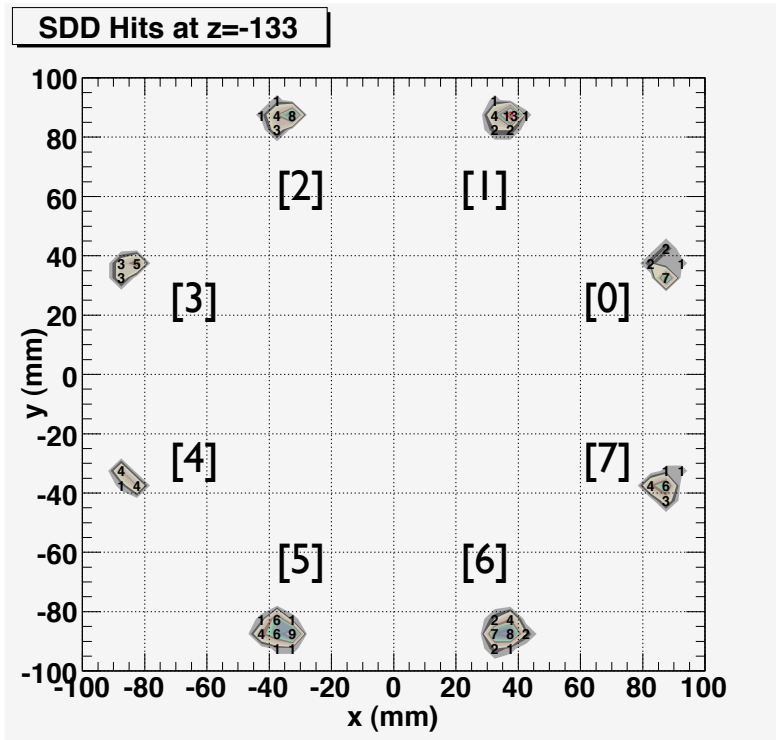
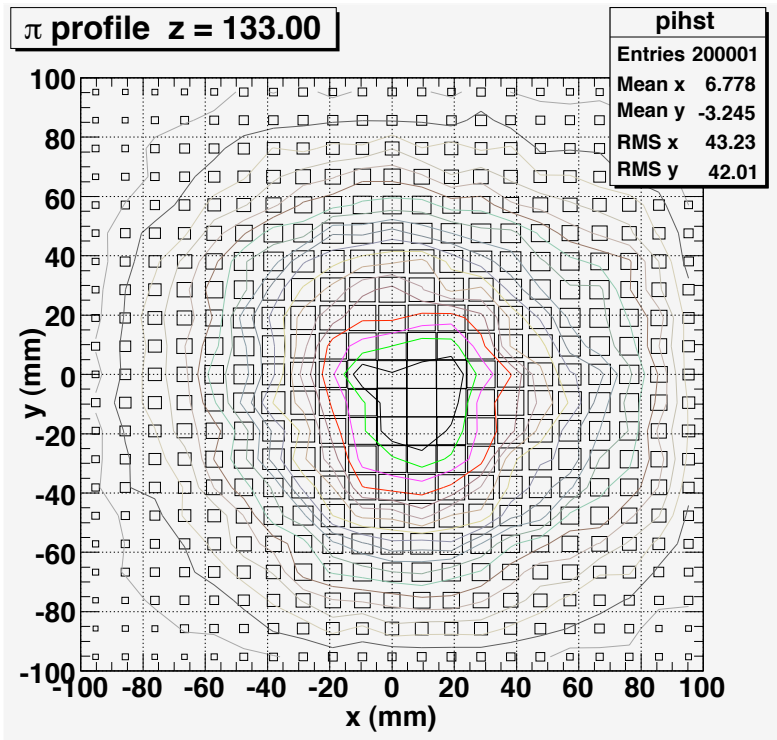
Ni Foils



Outer radius is 10 mm larger than target radius

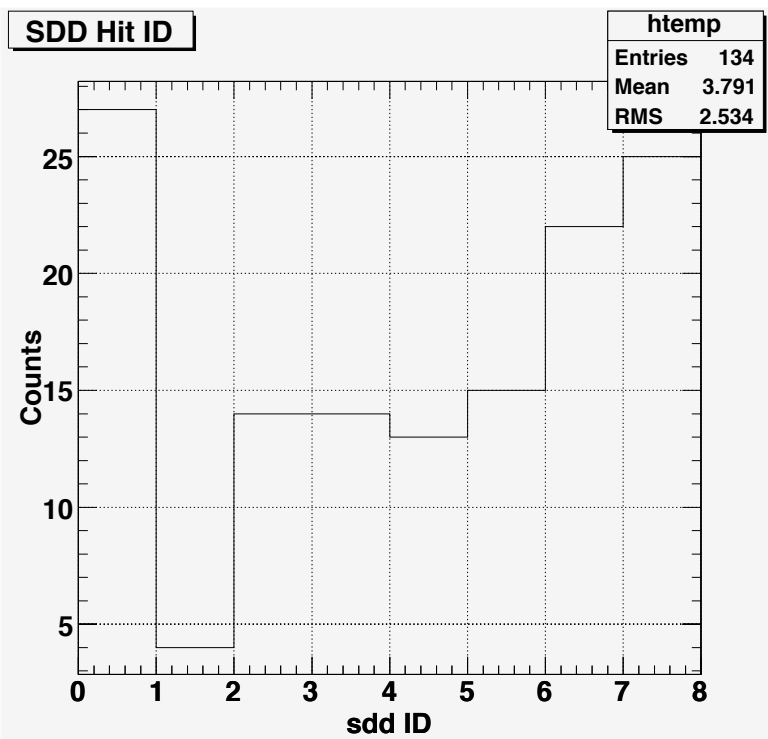
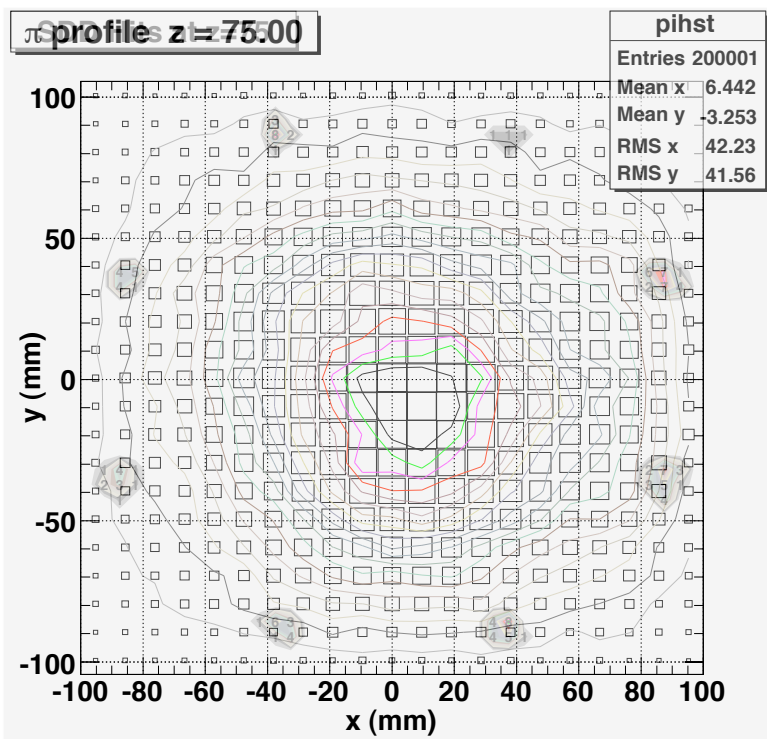
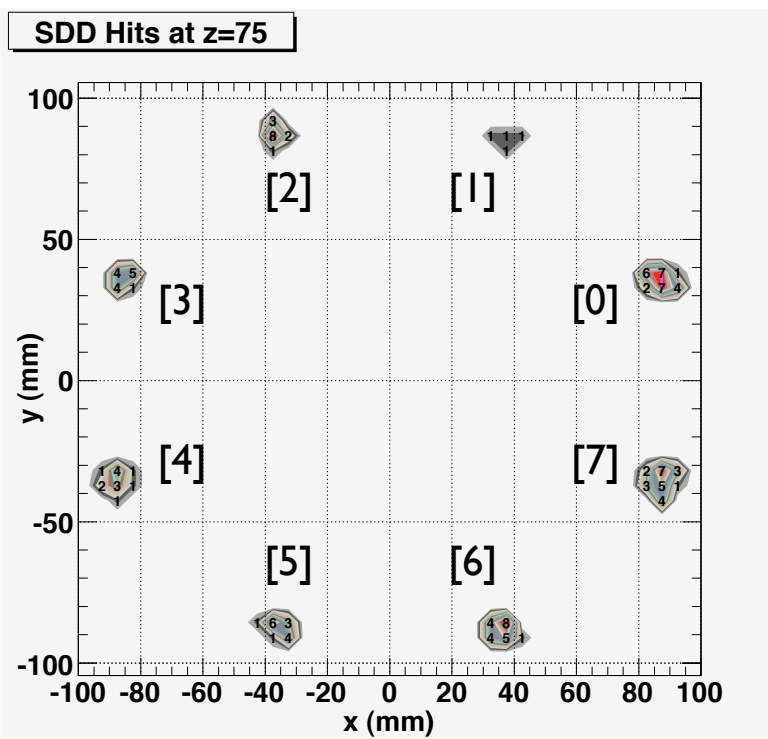
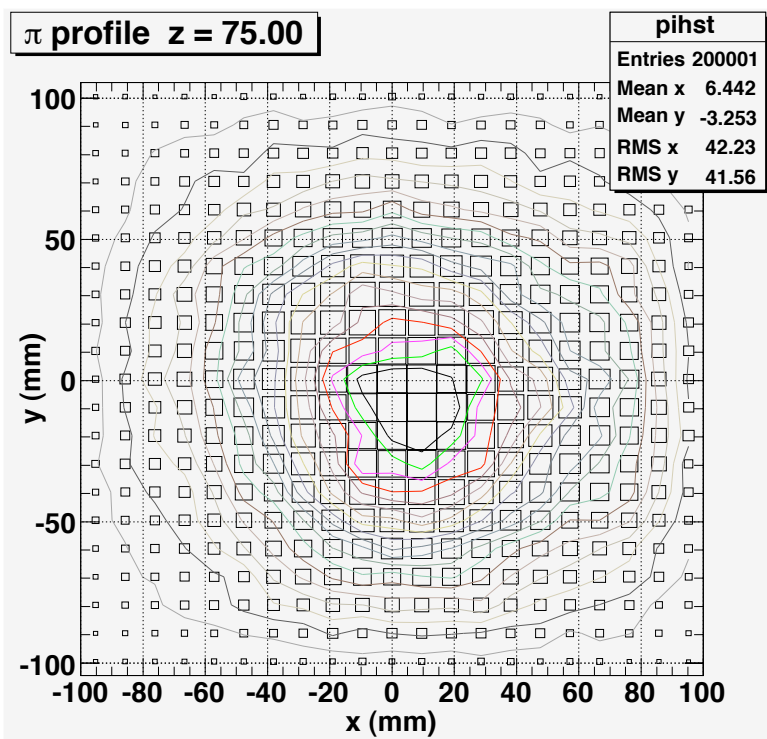
z=-133 Cone

Count rate : Ni 17.5 counts/spill
Ti 6.08 counts/spill



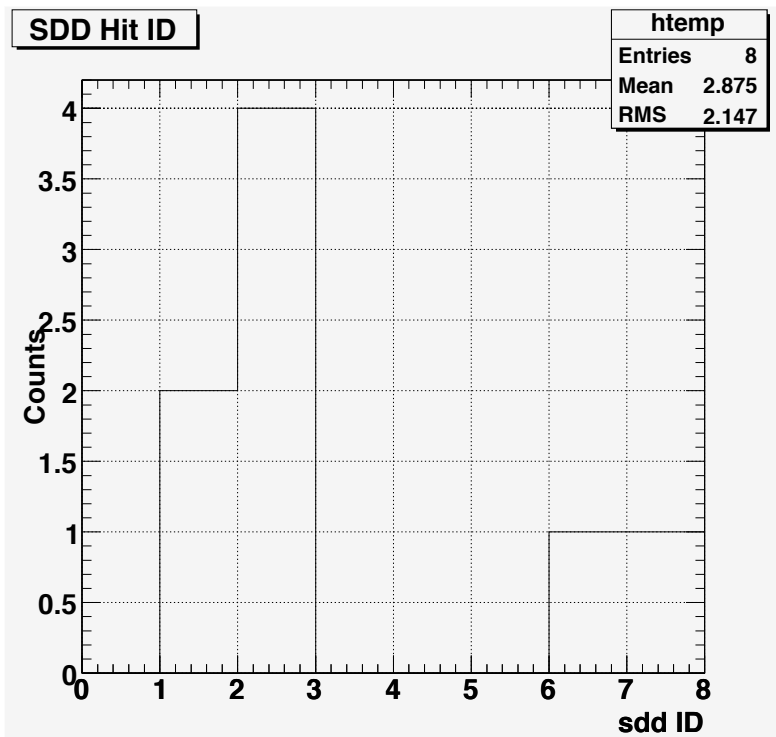
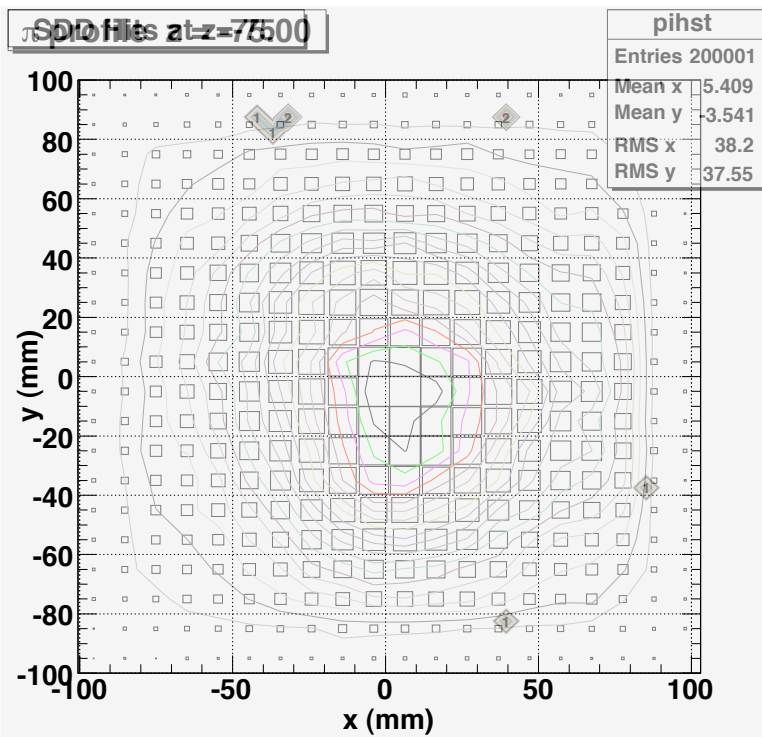
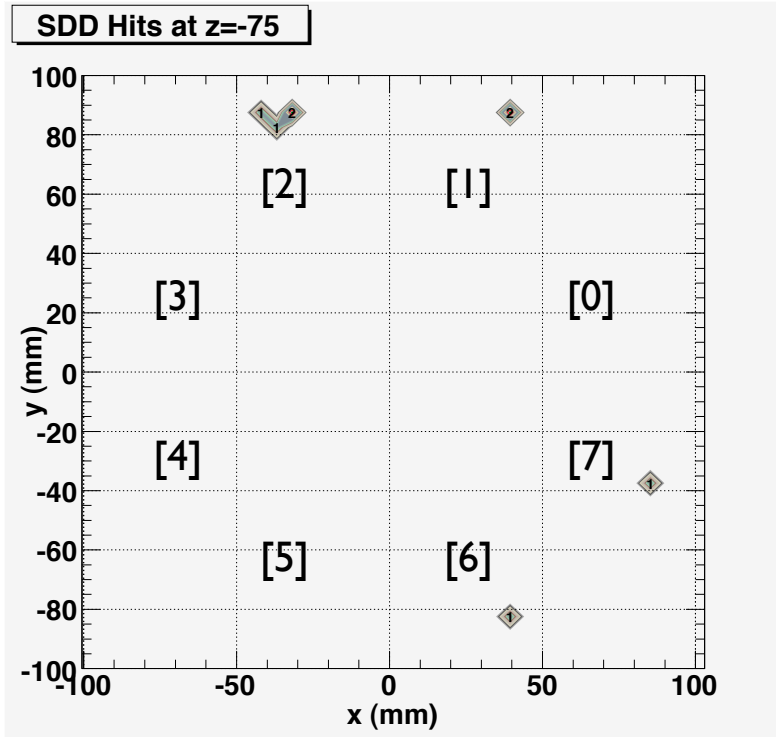
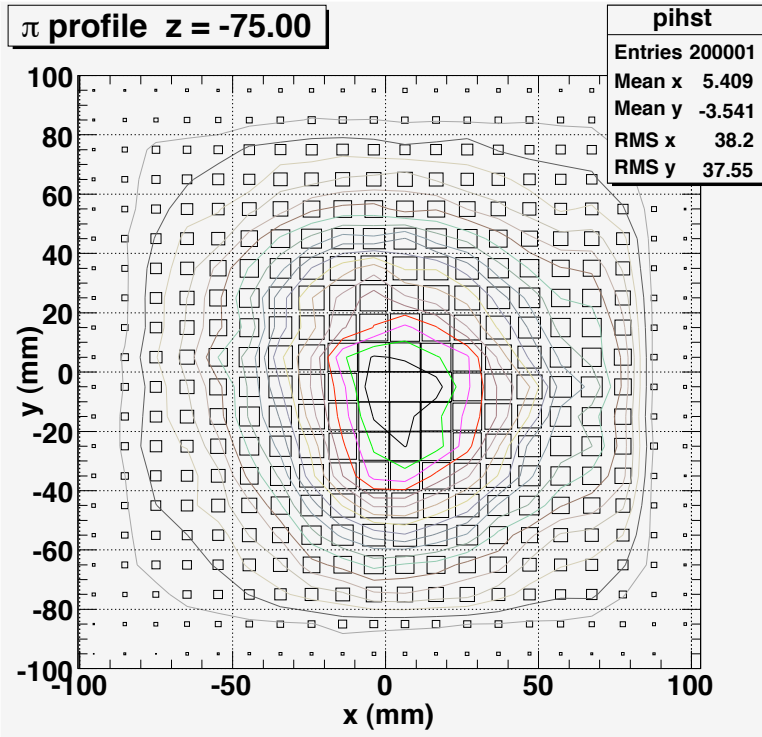
z=75 Downstream Glue Point

Count rate : Ti | 1.4 counts/spill



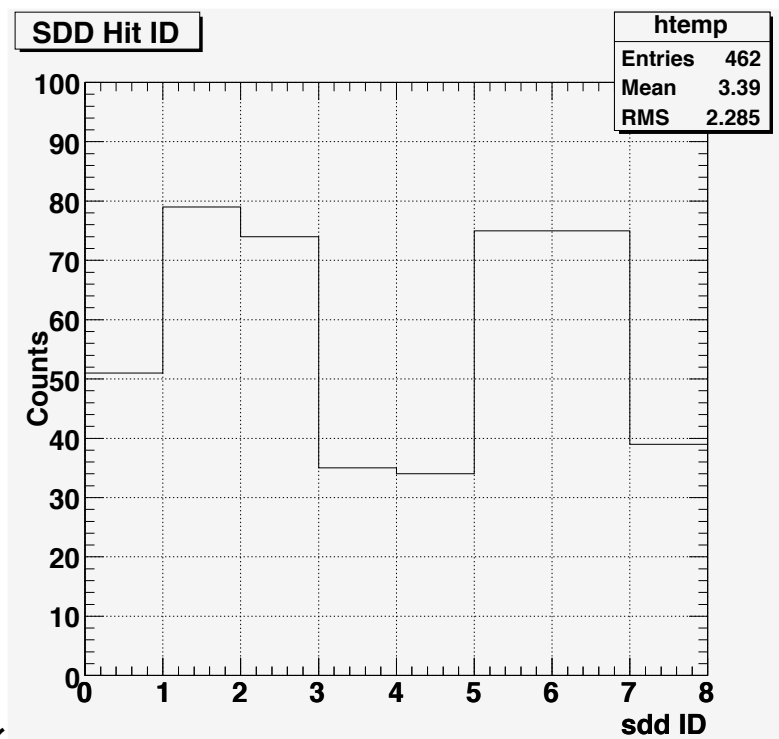
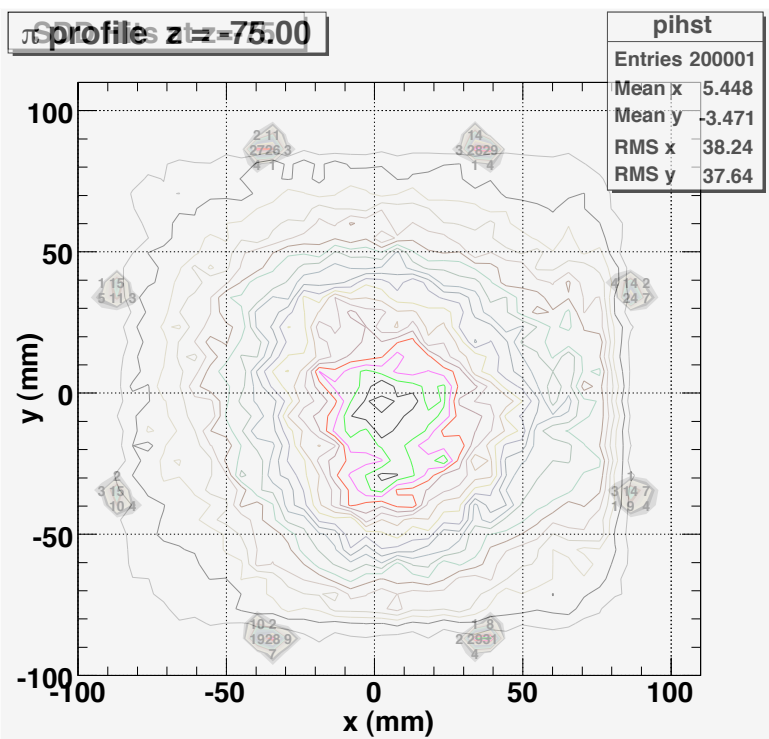
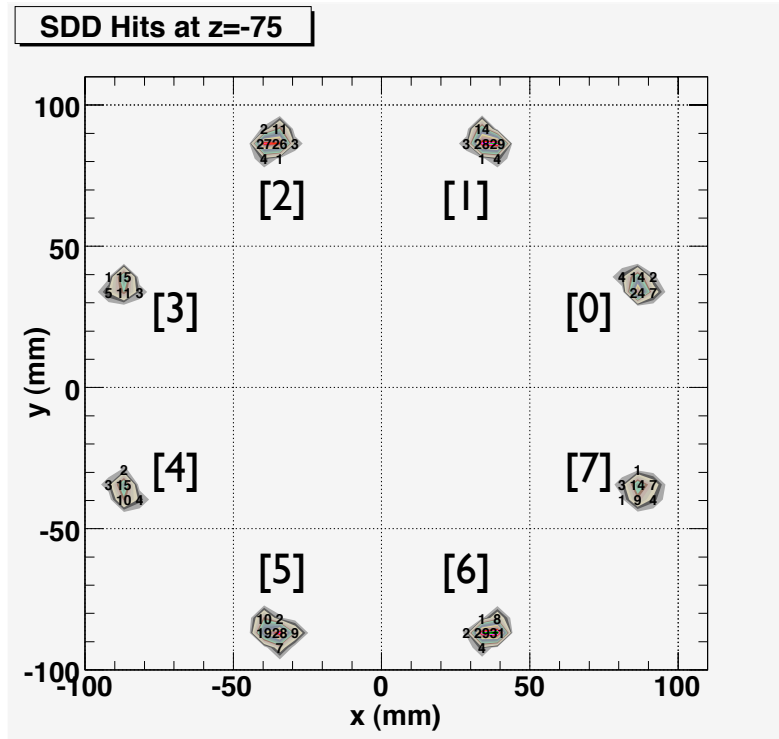
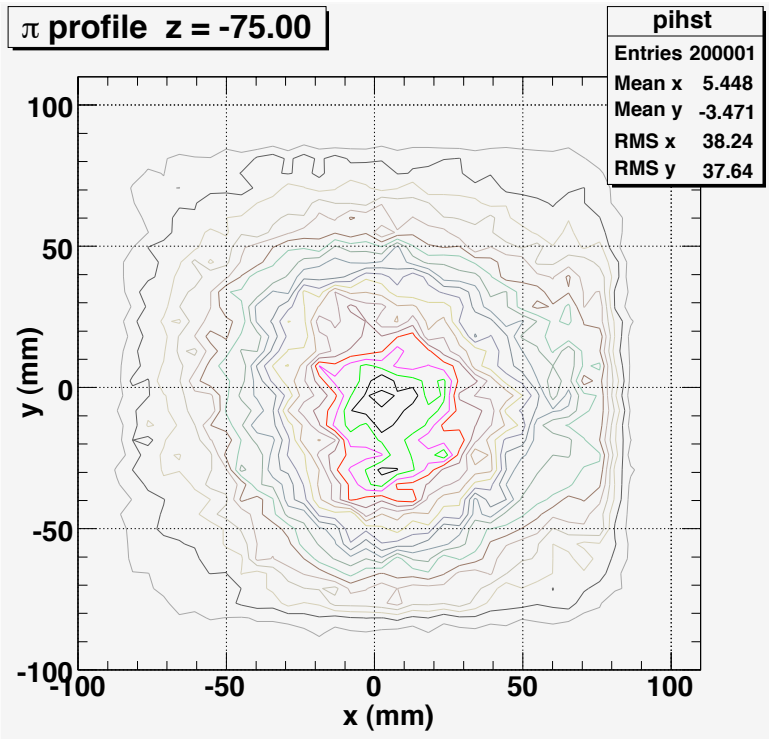
$z=-75$ Downstream Glue Point

Count rate : Ni 2.57 counts/spill



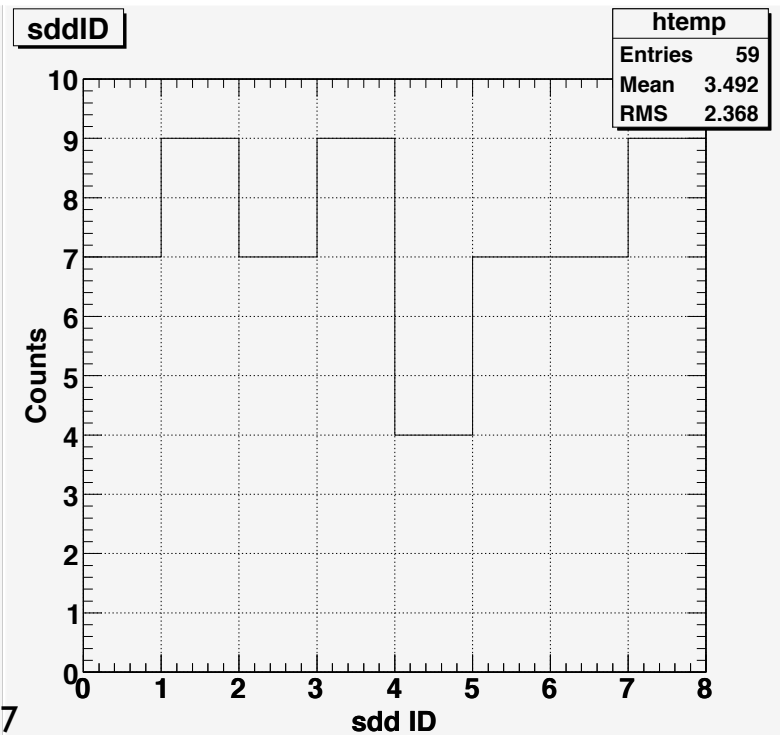
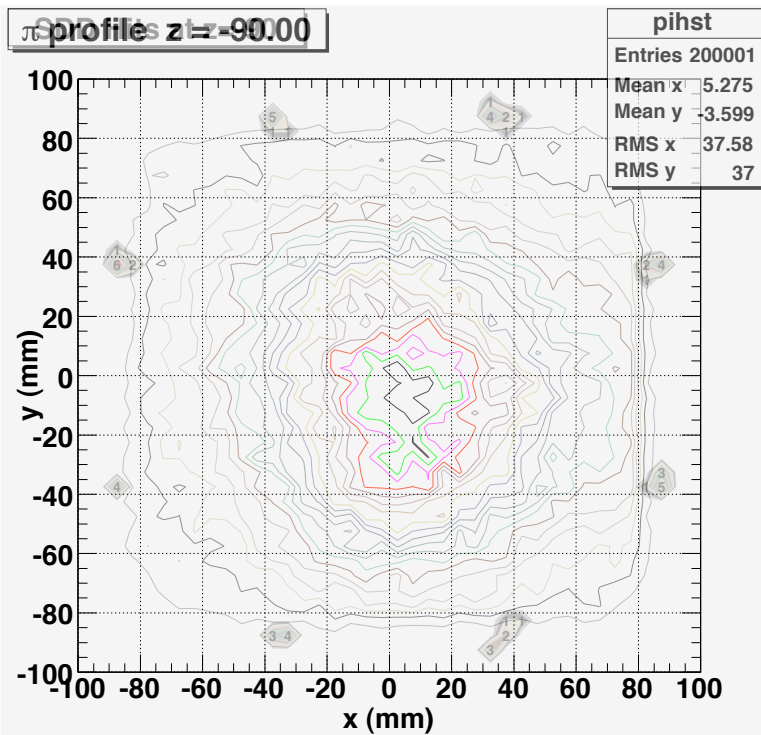
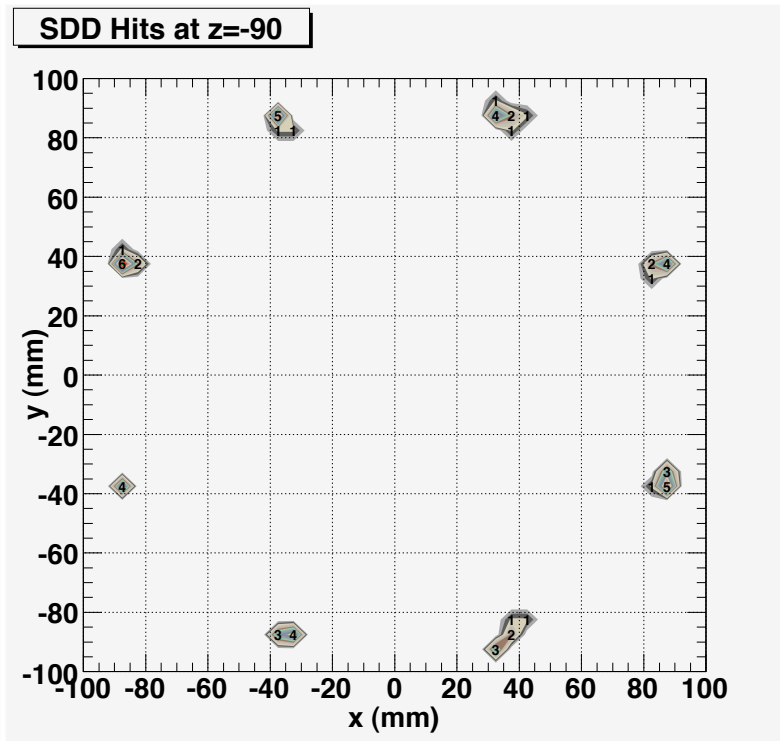
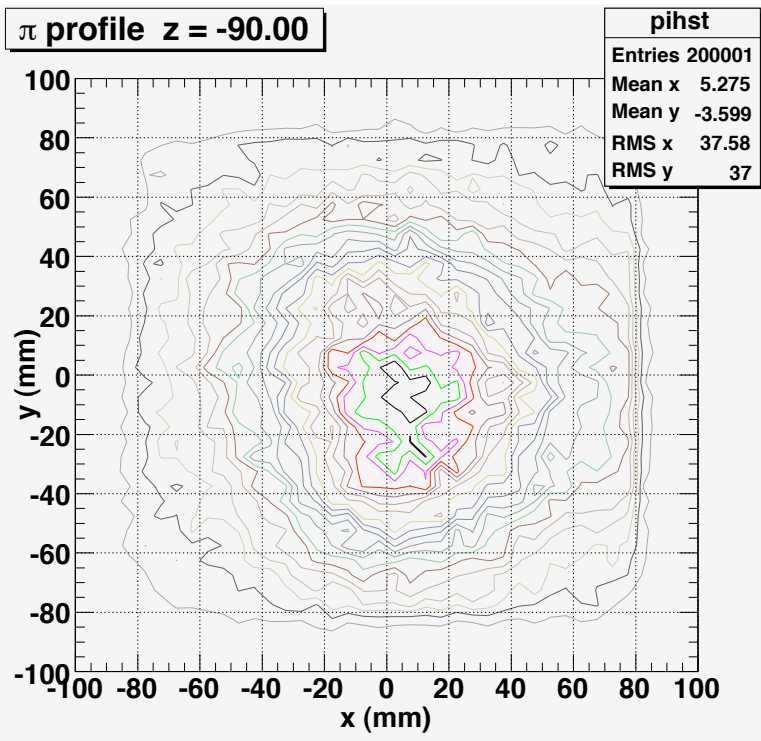
z=-75 Downstream Glue Point Entrance Ni Disk (r=100 mm)

Count rate : Ni 128.5 counts/spill



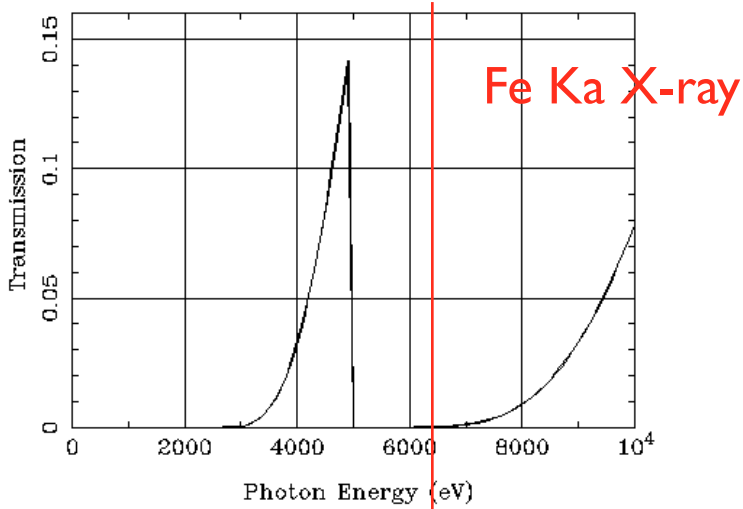
z=-90 Entrance Window Ni (200 x 200 mm)

Count rate : Ni 16.5 counts/spill



Filter Transmission

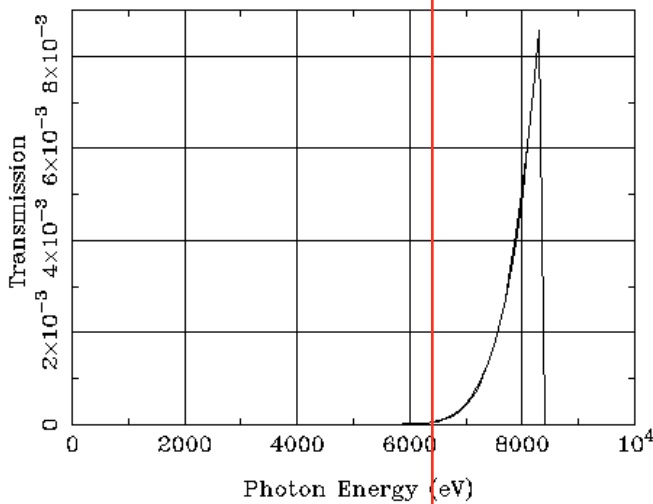
Ti Density=4.54 Thickness=50. microns



Ti 50 μ m thick

99.99+%
100x100 m : ¥239000

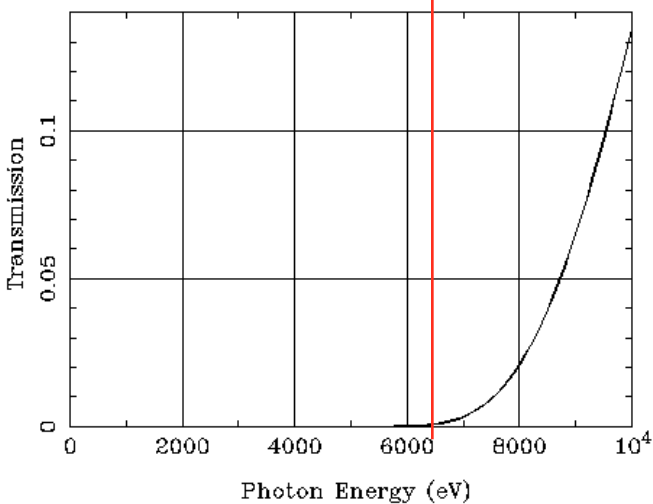
Ni Density=8.902 Thickness=125. microns



Ni 125 μ m thick

99.999%
100x100 m : ¥143000

Al Density=2.6989 Thickness=300. microns



Al 300 μ m thick

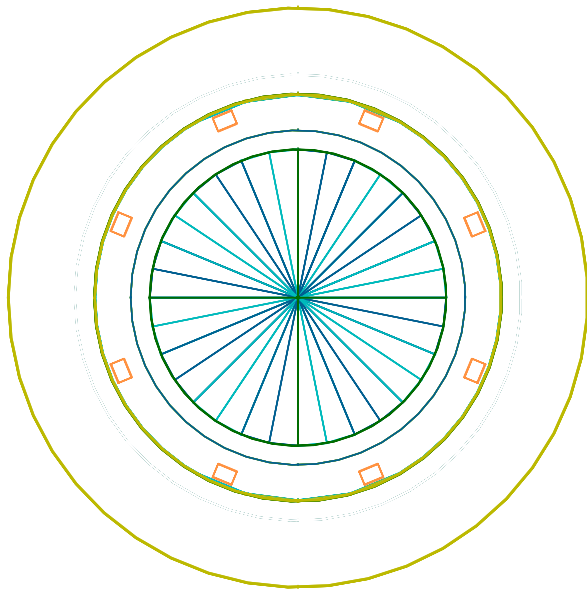
99.999%
100x300 m : ¥13000

Case I : Minimized Background

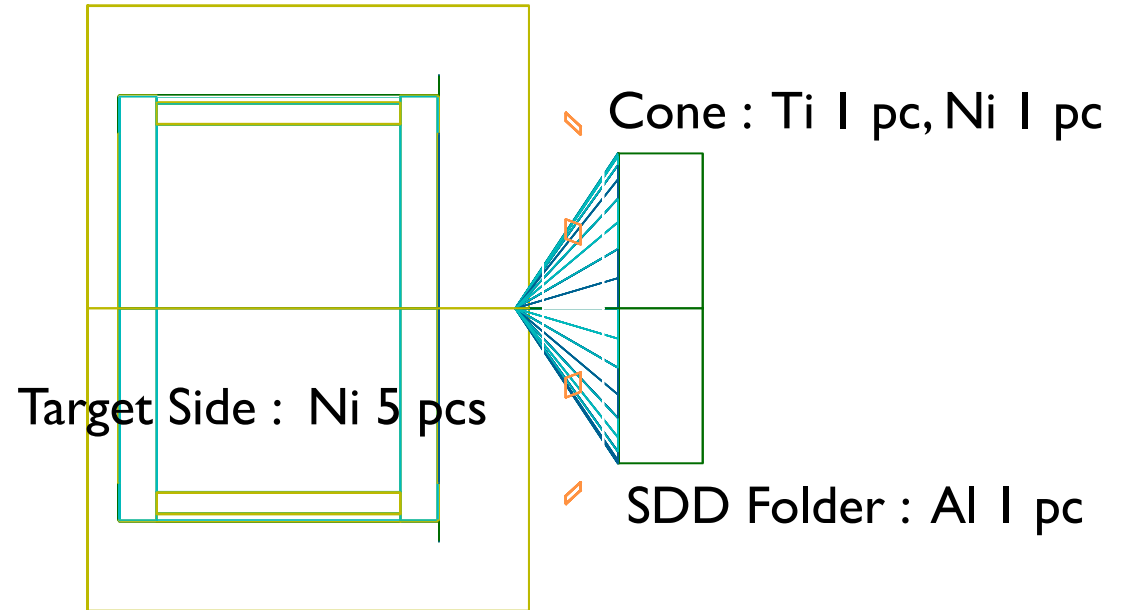
Count Rate : Ti 17.1 counts/spill
Ni 20.1 counts/spill

Entrance Window : Al 3 pcs

Side Cover : Al 6 pcs



Downstream Glue : Ti 3 pcs



Upstream Glue : Ni 2 pcs

LN2 Pipe : Al 1 pc

LHell Pipe : Al 1 pc

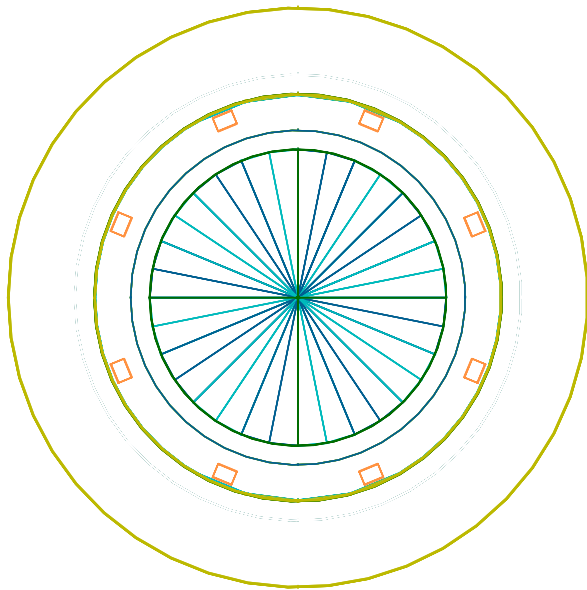
Total : Ni 8 pcs	¥1144000
Ti 4 pcs	¥956000
Al 12 pcs	¥156000
	¥2256000

Case II : Minimized Cost

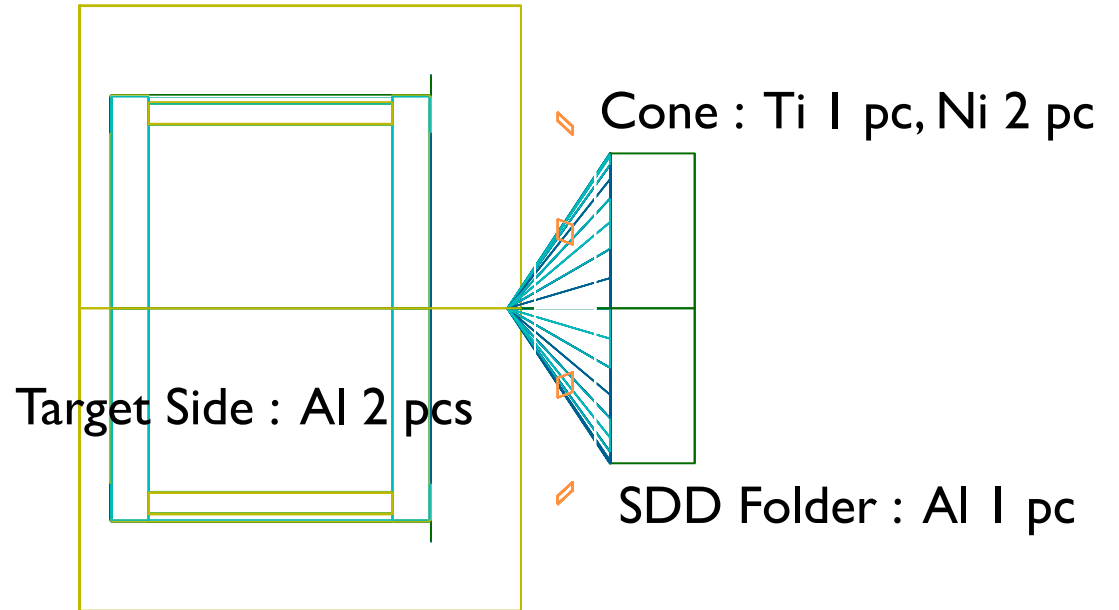
Count Rate : Ti 17.1 counts/spill
Ni 17.5 counts/spill

Entrance Window : Al 3 pcs

Side Cover : Al 6 pcs



Downstream Glue : Ti 3 pcs



Upstream Glue : Al 1 pcs

LN2 Pipe : Al 1 pc

LHell Pipe : Al 1 pc

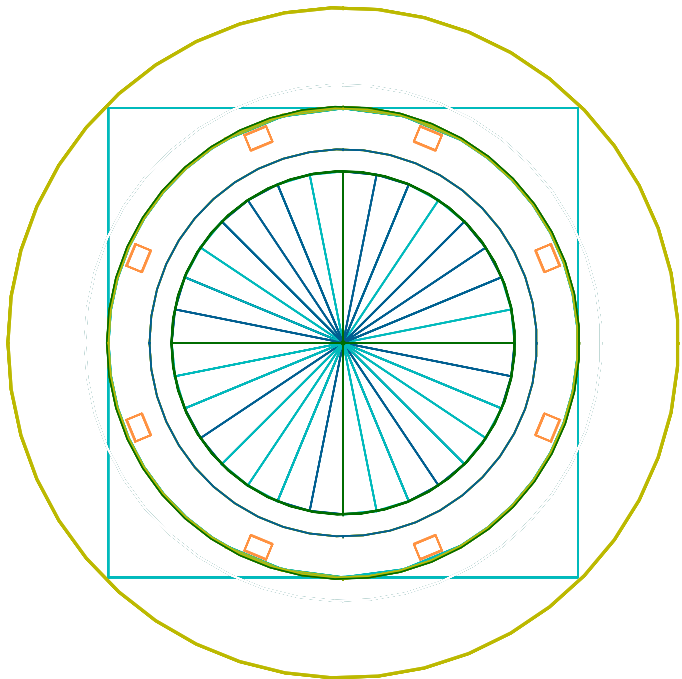
Total : Ni 2 pcs	¥286000
Ti 4 pcs	¥956000
Al 15 pcs	¥195000
¥1437000	

Case III : Maximized Count Rate + Case I

Count Rate : Ti 17.1 counts/spill
Ni 34.0 counts/spill

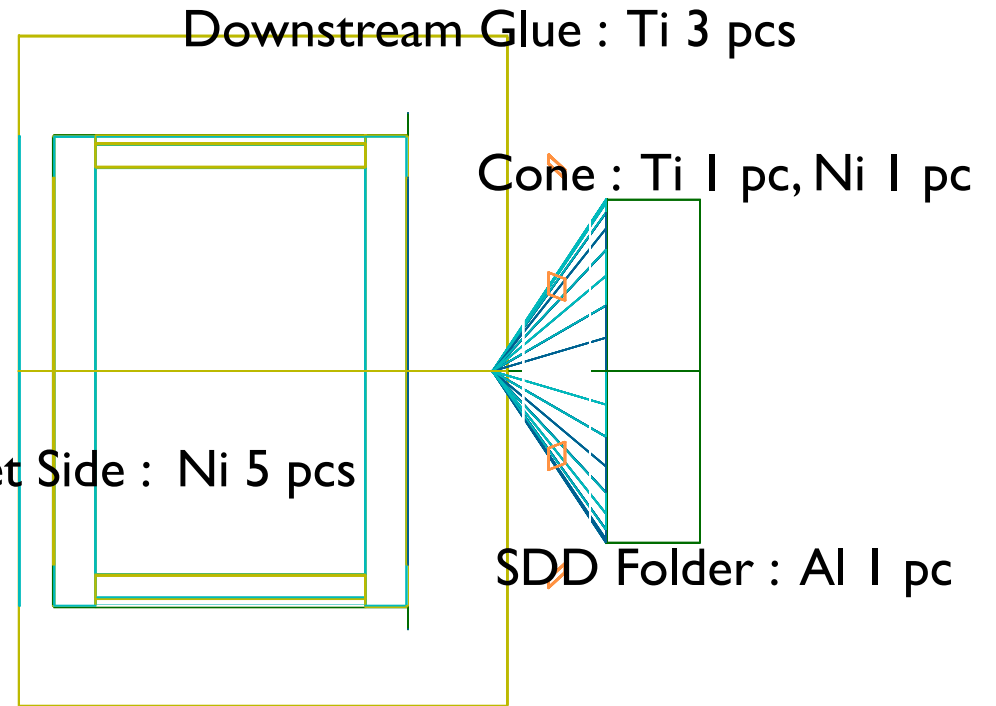
Entrance Window : Al 3 pcs + Ni 4pcs

Side Cover : Al 6 pcs



LN2 Pipe : Al 1 pc

LHell Pipe : Al 1 pc



Target Side : Ni 5 pcs

Cone : Ti 1 pc, Ni 1 pc

SDD Folder : Al 1 pc

Upstream Glue : Ni 2 pcs

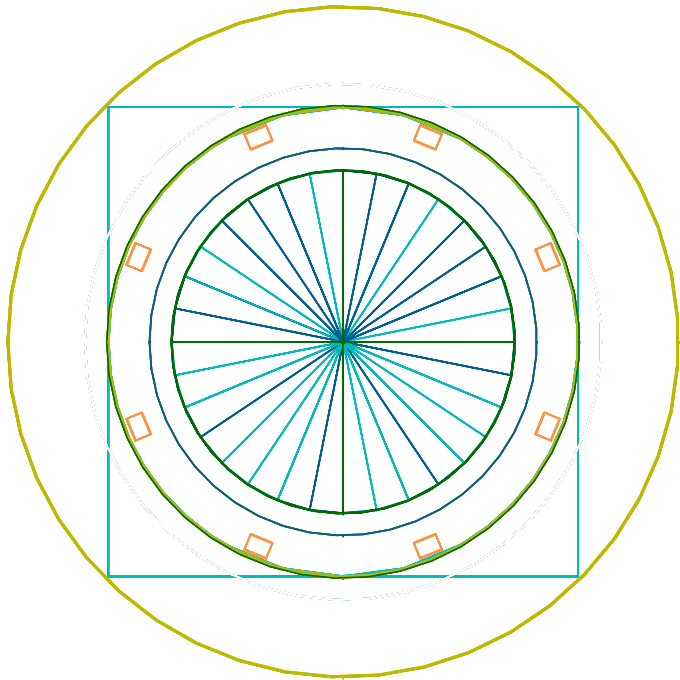
Total : Ni 12 pcs	¥1716000
Ti 4 pcs	¥956000
Al 12 pcs	¥156000
¥2828000	

Case IV : Maximized Count Rate + Case II

Count Rate : Ti 17.1 counts/spill
Ni 34.0 counts/spill

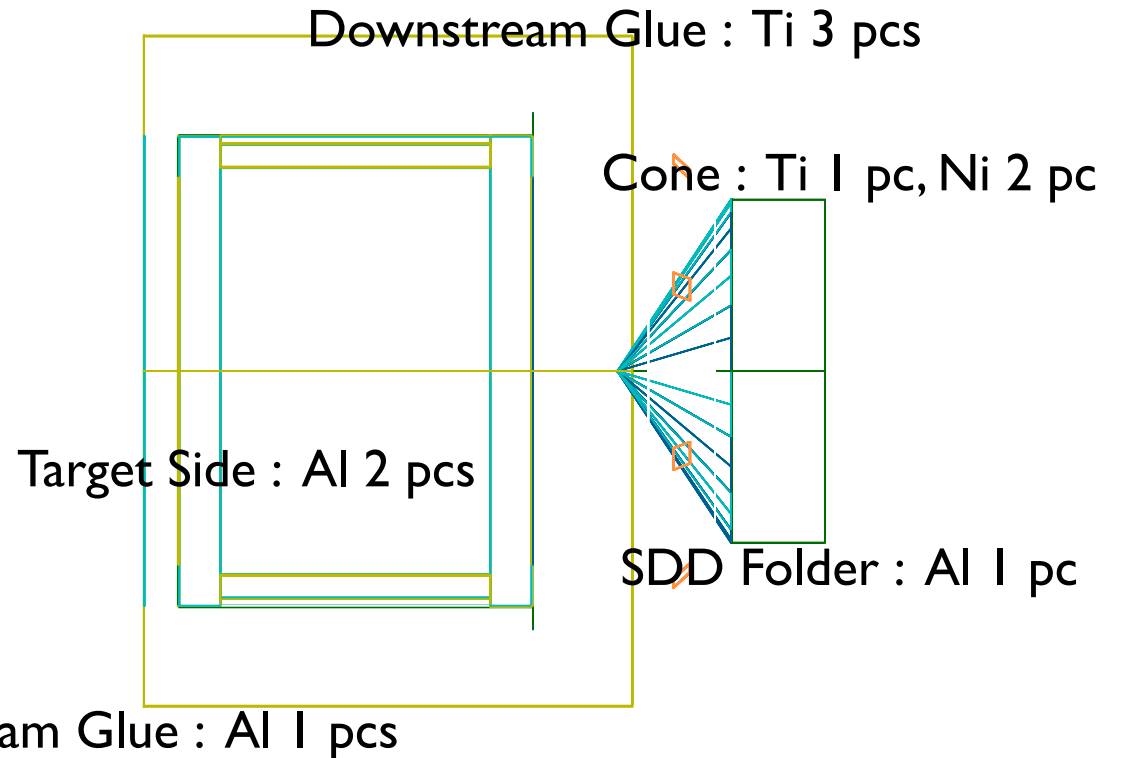
Entrance Window : Al 3 pcs + Ni 4pcs

Side Cover : Al 6 pcs



LN2 Pipe : Al 1 pc

LHell Pipe : Al 1 pc



Total : Ni 6 pcs ¥858000

Ti 4 pcs ¥956000

Al 15 pcs ¥195000

¥2009000

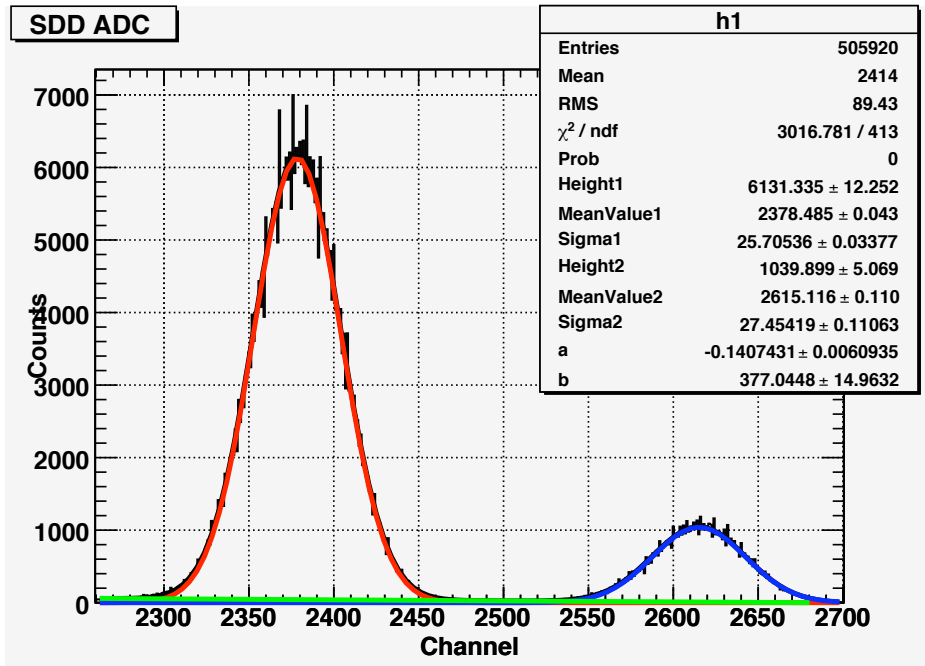
Other SDDs Test

SDD No.2 and No.3 were tested. It is recognized that SDD has characteristic gain and high voltage dependence. So we must calibrate each energy spectrum independently and separate power supplies.

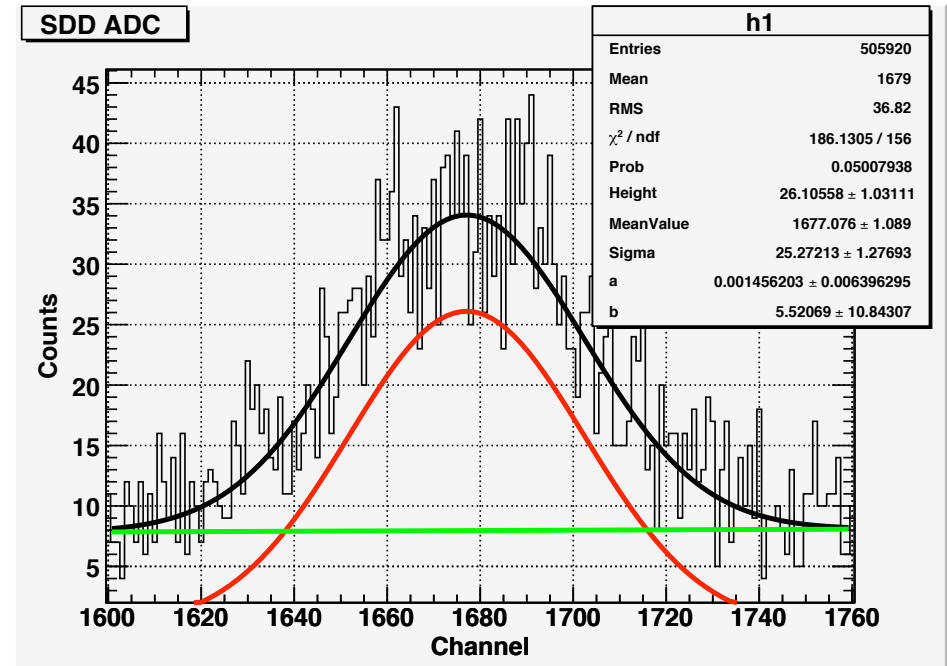
As GEANT simulation shows, each SDD count rate is different because of beam polarization and X-rays attenuation. Therefore it may be difficult to calibrate energy spectrum independently..

SDD No.2 Test

Mn Ka, Kb



Mn Ka (Si escape)



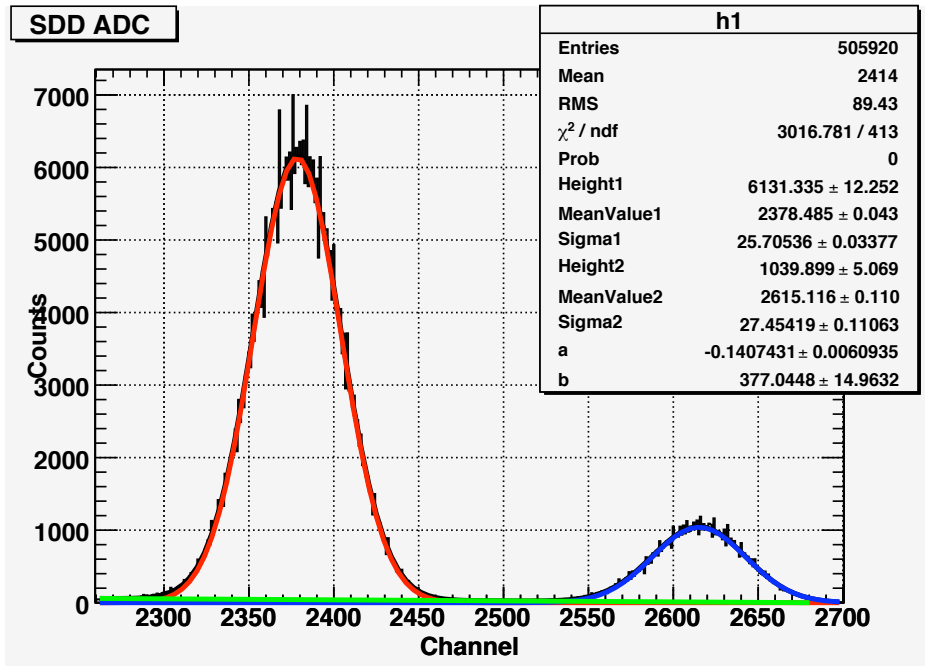
Ich = 2.51615 (eV/ch)
 Xray mean = 2378.48 (ch)
 Xray mean = 5895.05 (eV)
 FWHM = 152.306 (eV)
 Xray event = 395065 (Counts)

Ich = 2.51652 (eV/ch)
 Xray mean = 1677.08 (ch)
 Xray mean = 4129.94 (eV)
 FWHM = 149.761 (eV)
 Xray event = 1653.73 (Counts)

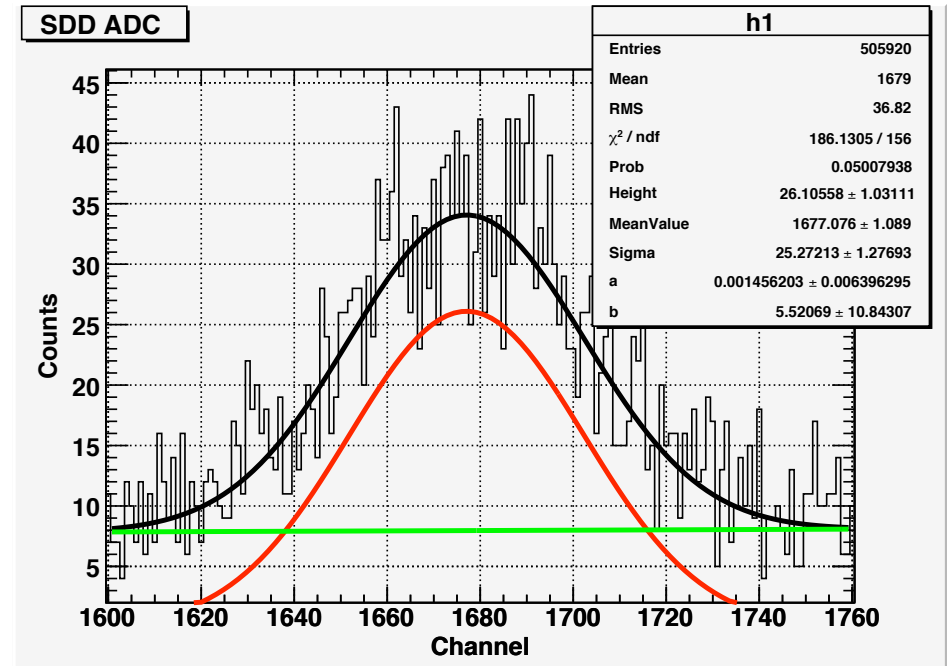
SDD No.2 gain is higher than No.1
 Gain ratio = 2378.5 / 2008.4 = 1.18

SDD No.3 Test

Mn Ka, Kb



Mn Ka (Si escape)



Ich = 2.51077 (eV/ch)
 Xray mean = 2391.76 (ch)
 Xray mean = 5895.05 (eV)
 FWHM = 165.118 (eV)
 Xray event = 669289 (Counts)

Ich = 2.51077 (eV/ch)
 Xray mean = 1687.08 (ch)
 Xray mean = 4125.78 (eV)
 FWHM = 156.75 (eV)
 Xray event = 2578.18 (Counts)

SDD No.3 gain is higher than No.1
 Gain ratio = 2391.8 / 2008.4 = 1.19

High Voltage was changed...

No.1 : (RX, RI, Back) = (-110.2, -10.30, -64.1)
 No.3 : (RX, RI, Back) = (-105.1, -10.29, -63.0)

Improvement of the LHeII Target for E570 Experiment

Schematic of the target is at next page

<Components>

The components of the target for improvement were ordered from the company.
(The parts of the shape of a disk for fixing SSDs, The vacuum pipe for signal readout ...)

→ Most components will be delivered in the beginning of next week.

The CFRP vacuum pipe will be cut and delivered on Aug 1 or 2.

→ We will begin to assemble parts of the cryostat from next week

- Other parts -

The 8 hermetic ports for signal readout were made from sealing with solder.

They were tested under vacuum using RP and TMP.

As a result of test, all ports could isolate to the order of $\sim 10^{-6}$ Torr

→ We will make the inside cables (~500 mm) and connector.

The target cell will be improved by taking away a mylar window of beam line and putting pure Al and Ni(?) sheets with stycast, when sheet will be delivered.

<Test with LN₂>

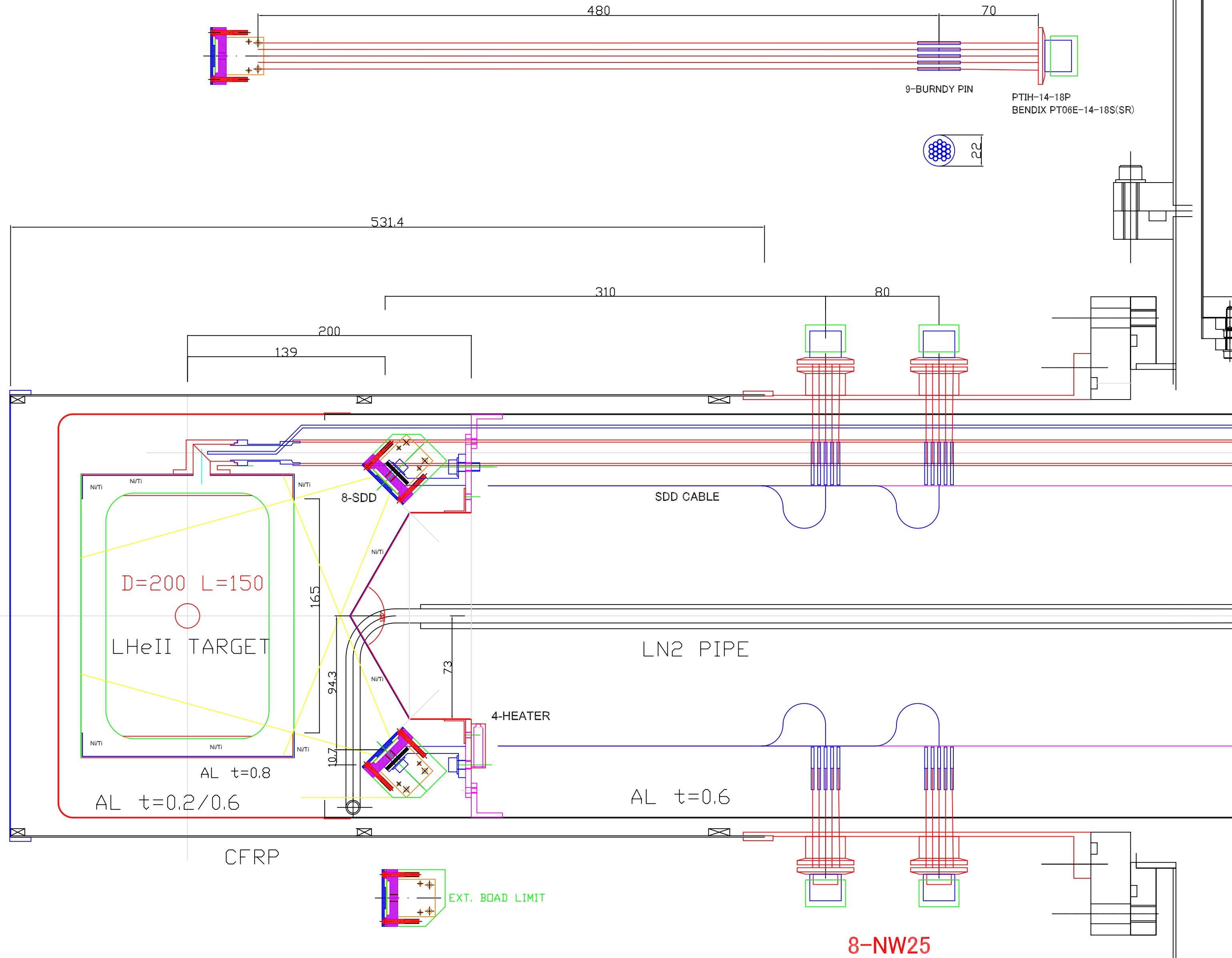
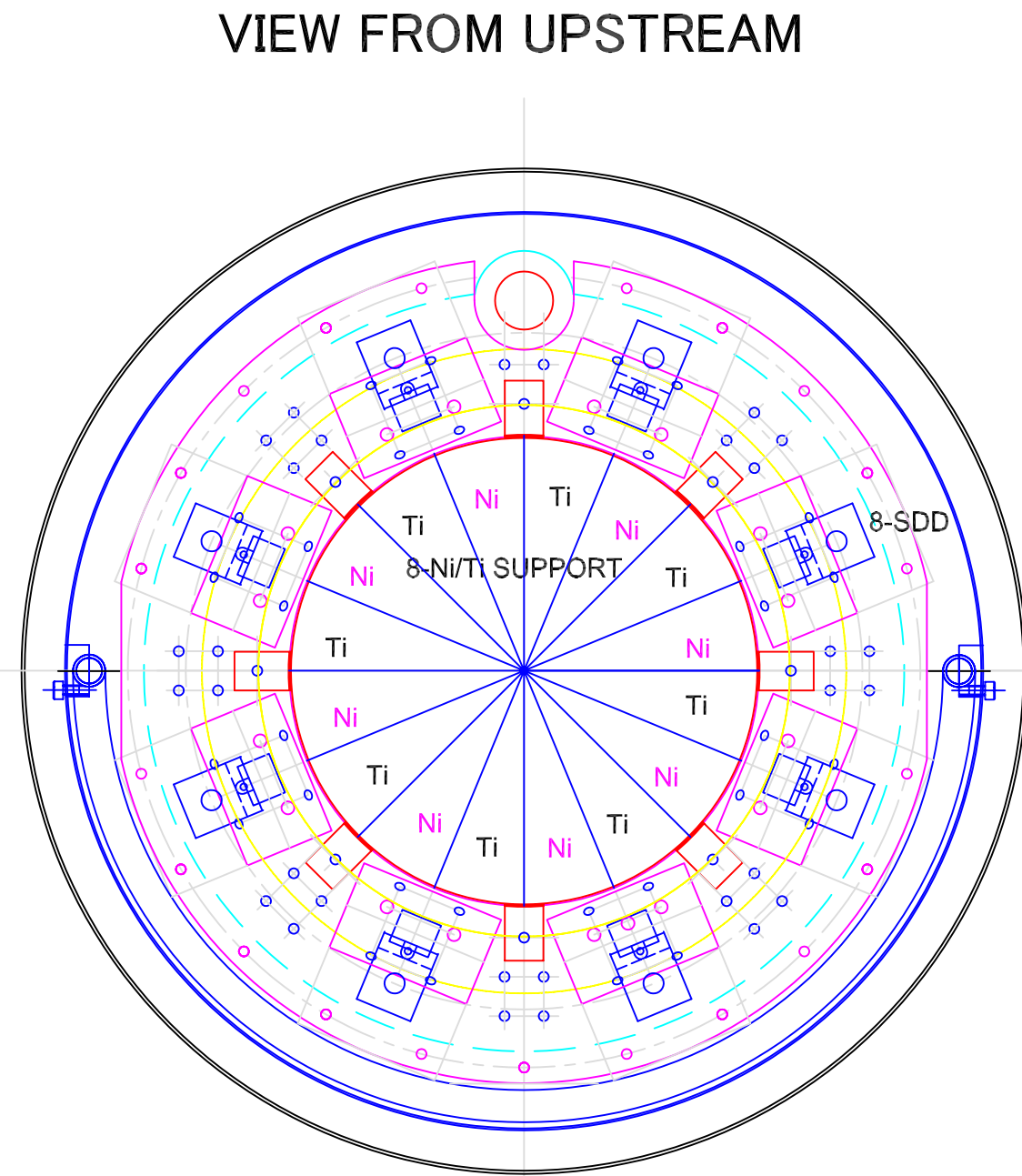
We will start LN₂ cooling test with 8 dummy SDDs in the week Aug 8th

- The aim of LN₂ cooling test -

1. Operation test of the SDDs temperature control at 80 K
2. Measurement of the heat input to radiation shield with 90 or 122(?) cables

L-HeII TARGET for E549/E570

2005/7/24 S. ISHIMOTO KEK



Manufacturing of divider for 8 SDDs

The 3 SDDs was tested in order to check of operation.

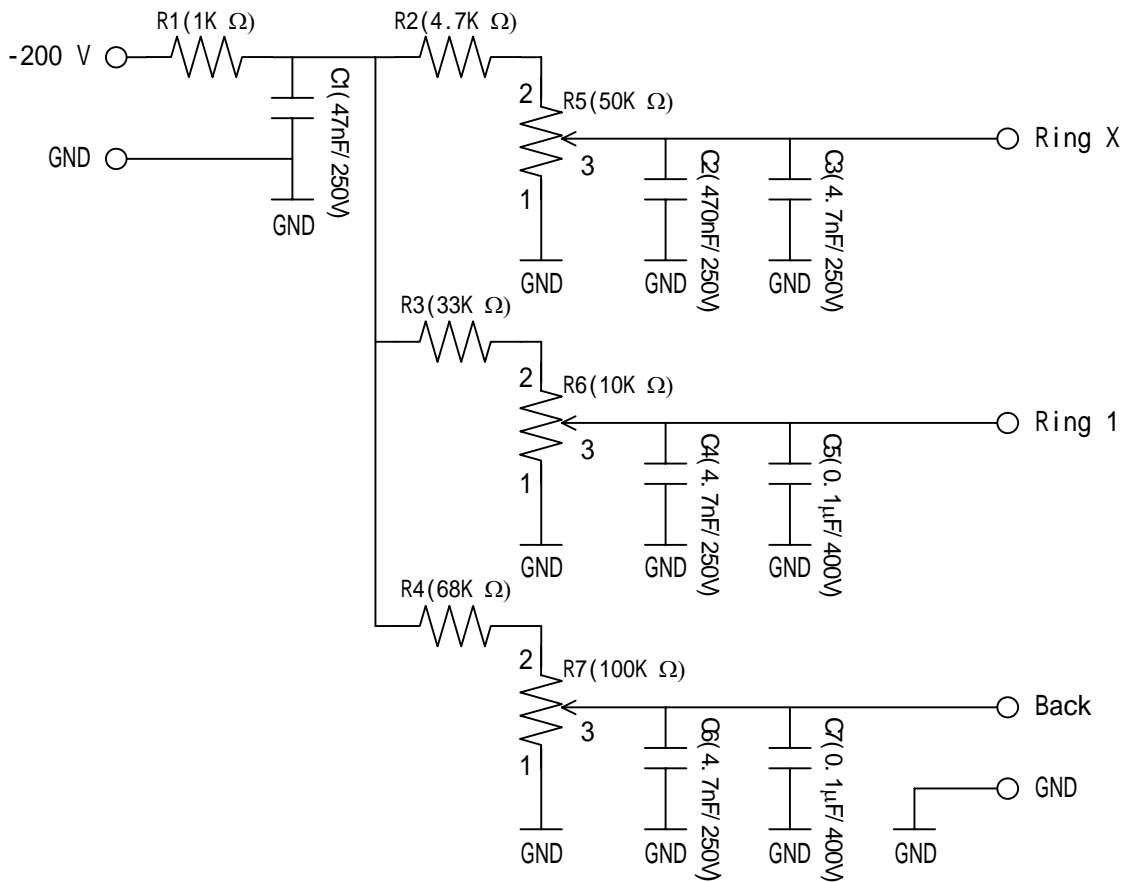
Each SDDs had optimal voltage as a result of test. (See a lower table)

→ We should have 8 high voltage dividers.

	No.1	No.2	No.3
Ring X	-110.2 V	-110.2 V	-105.1
Ring 1	-10.3 V	-10.3 V	-10.3
Back	-64.1 V	-64.1 V	-63.0

We made a divider box which has 2 dividing circuit.

→ We will make more 3 divider boxes.



E570 meeting

Preparation status of E570

SDD

- SDD
 - Two SDDs and four preamps, of which two are for backup, are additionally ordered by Matsuda-san from RAL.
 - It will be delivered to RAL on 8th Aug ~ 13th Aug.
 - Matsuzaki-san or Matsuda-san will bring it from RAL to RIKEN on 15th Aug. (?) (in case of Matsuzaki-san) or 22th Aug. (in case of Matsuda-san).
 - A thin wire bonded to backplane of our SDD was pulled out by mistake during work.
 - We send the SDD to KETEK for repairing on 25th July. ...await an answer.
- Preamp
 - Preamp box will be cooled by water-cooling system using copper pipe.
 - (→ will be ordered to CI-kogyo)
 - Water circulation unit was borrowed from KEK (Ishimoto-san and Tanaka(Nobuaki)-san)).
 - * Neocool circulator (Model CF700) (YAMATO SCIENTIFIC CO.,LTD.)
 - Preamp support should be designed.
- SDD support
 - Aluminum holder should be ordered.
 - Front face of the holder (SDD side) will be covered by pure aluminum to avoid x-rays from impurity of the aluminum holder.
 - Aluminum cover should be made from pure aluminum.
 - We have already a pure aluminum plate (99.999%).
 - * Nilaco AL-013606 ... size 3.0*100*300mm (¥33,500)
 - The cover size (40*46mm) will be enlarged in order to avoid x-rays from backside of SDDs.
- Power supply
 - We have only three power supplies borrowed from KEK electronics pool.
 - KIKUSUI PAB350-0.1 × 1
 - KIKUSUI PAB350-0.2 × 1

KIKUSUI PAB250-0.25 × 1

➤ We ordered two power suppliers of which one is for backup.

KIKUSUI PMC350-0.2 ¥69,000 × 2

- Power supply divider (resistive divider)

Now, we are making four power supply dividers. (One divider is for two SDD's power inputs.)

Electronics

- TDC

➤ A TKO TDC (HR-TDC) was modified to have long full range (1μsec → 5μsec) by Sasaki-san and Shimazaki-san. → The operation check was done.

We will ask REPIC to modify two more HR-TDCs of which one is for backup.

- Shaping amp

➤ We have borrowed 36 modules of ORTEC570 from Tanaka(Banpaku)-san.

So, now we have 40 modules of ORTEC570.

➤ We are going to borrow CAEN 16 channel programmable spectroscopy amplifier “N568BD” from SMI.

We also bought the same amplifier which will be delivered middle of September.
(cost ... ¥ 1,277,000)

Now we are asking SEIKO EG&G about delivery date of CAENET controller.
(cost ... A1303: ¥160,000, A250: ¥260,000)

Temperature control

- LakeShore 340

Temperature controller “LakeShore 340” has been ordered. It will be delivered middle of September.

(cost ... ¥969,150)

- Temperature Sensor

Platinum temperature sensor “LakeShore PT-102” has been ordered. It will be delivered beginning of September.

- We need to prepare the reading system of LakeShore 340 with GPIB(?). → not yet.

GAS

- We have ...

➤ Isobutane ... New : 2 bottles, Used : 1 bottle

➤ Ar + C2H6 ... New : no bottle, Used : 2bottles

➤ Methylal ... New : 13 bottles, Used :1 bottle

So we ordered 5 bottles of Ar+C2H6. (delivery date ... end of Aug.)

Air conditioner at K5 area

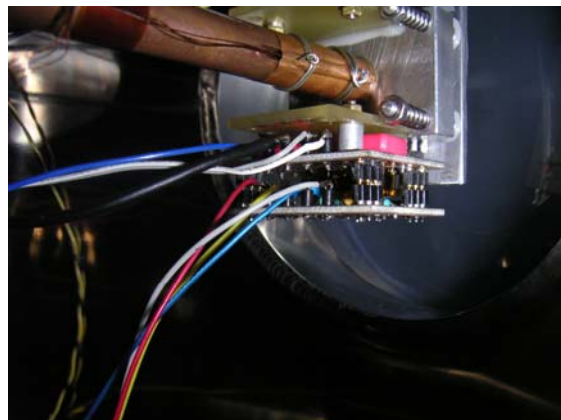
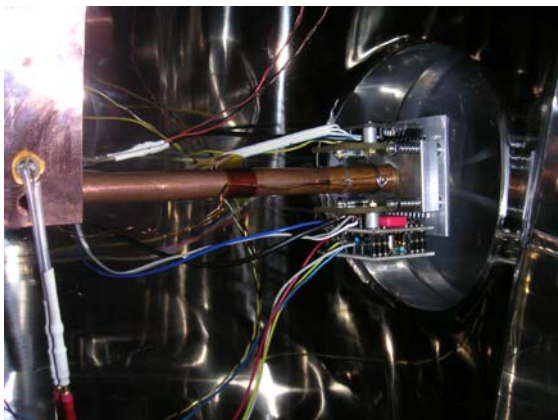
- We asked Tanaka(Nobuaki)-san to install an air conditioner additionally. It will be placed on the concrete block of upstream of the area instead of our air compressor. The air compressor will be moved to the large green rack which is right next to the concrete block and on which the other air conditioner is placed.
- We also asked Tanaka(Nobuaki)-san to install a spot cooler near by the HV rack which is placed just right of K5 area entrance.

Foils

- Pure Ni & Ti ... GoodFellow : delivery date ...within 1.5 months of the receipt of an order.
Now we are asking Nikikogei company to find another GoodFellow's stock which has similar spec and whose delivery time is less than one month.
- Pure Al ... Niraco ... instant delivery

Things to do list (for next week)

- Check for the CAEN spectroscopic amp borrowed from SMI.
- Test for backplane signal reading
 - Taniguchi-san modified the mini-board (power supply side) to get the signal from the backplane (see following pictures).
 - Now, Taniguchi-san is making the preamp board. → We can do the backplane signal test from tomorrow.





ANALYSIS DATA SHEET

ITEM No. 13553 他 Date 2005/6/22

ITEM アルミニウム 板 Person in charge K. Shimizu

PURITY _____ DIMENSIONS 母材の分析値です。

Analysis Data Sheet has been carried out on this batch of material,
either in its final form or at an earlier stage in its mechanical working,
with the following result:

				ppm
Ag	Eu	N	Si	6.4
Al	Fe 0.3	Nb	Sm	
As	Ga	Nd	Sn	
Au	Gd	Ni	Sr	
B	Ge	O	Ta	
Ba	H	P	Tb	
Be	Hf	Pb	Te	
Bi	Ho	Pd	Th	
C	In	Pr	Ti	0.1
Ca	Ir	Pt	Tl	
Ce	K	Rb	U	
Co	La	Re	V	
Cr 0.2	Li	Rh	W	
Cs	Lu	Ru	Y	
Cu 0.1	Mg 0.1	S	Yb	
Dy	Mn 0.3	Sb	Zn	0.2
Er	Mo	Sc	Zr	

All results are expressed as parts per million
by weight (ppm) unless otherwise noted.
A blank indicates an element specifically sought
but not found.

We believe this information to be accurate but we assume no responsibility and
disclaim any liability incurred in using these data or suggestions. Nothing in this
data sheet should be construed as a recommendation or permission to use any
product or process covered by existing patents or patent application.

FAX送信案内**05/07/28**

送信先: 理化学研究所

岡田 様

TEL: 090-8452-2288

FAX: 020-4669-3030

発信元: 梶川 明子 Meiko Kajikawa
 仁木工芸株式会社 Niki Glass Co., Ltd.
 東京都港区三田 3-9-7 〒108-0073

TEL: 03-3456-4700

FAX: 03-3456-3423

e-mail: meiko@nikiglass.com

HP URL: <http://www.nikiglass.co.jp/>

件名: Ni箔 Ti箔 御見積 (Q299794)

送信枚数: 1 枚

いつも大変御世話になっております。掲題の件、価格・分析値は下記の通りです。

御検討の程、宜しく御願ひ致します。

1. NI000525 Nickel Foil Ni 99.99%

Temper : As rolled

Thickness : 0.125mm

Size : 100mm x 100mm

8枚 御注文の時 単価 107,250円

(分析 ppm by weight)

Al .7 Fe .8 Mo 2 Na 1 Si .9

2. TI000315 Titanium Foil Ti 99.99+%

Temper : As rolled

Thickness : 0.05mm

Size : 100mm x 100mm

4枚 御注文の時 単価 179,250円

(分析 ppm by weight)

Al 1.6 As 2.5 C 19.5 Fe 19
Ni 12 Rb 5 Sb 4.5 Si 1.05 Ta <5

納期: 1,2 とも 受注後約 1.5ヶ月

A certificate of analysis will be supplied with both items.

Tolerances

Unless specified above our standard tolerances are :

Thickness: <0.010mm ±25%

0.010 - 0.050mm ±15%

>0.050mm ±10%

Size (linear dimension): <100mm ±1mm

>=100mm +2% / -1%