

SDD test setup

Vacuum chamber

Cryostat
SHI RDK-415D



Vacuum pump
(rotary + turbo)

SDD window
(mylar sheet : 188 μ m)

Side view



Brass (cooling finger)

Cu (cooling finger)

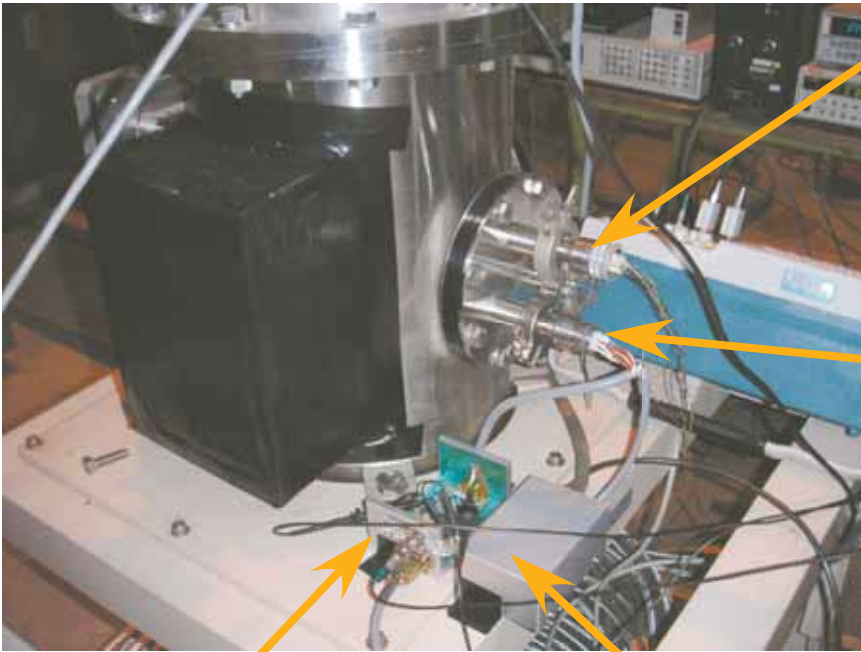
^{55}Fe source

Mylar window

SDD folder

heater
(20W+20W)

PtCo
resistance thermometer bulb



Cable for temperature control

For heater (2set) : 4 cables
 For thermometer : 4 cables
 >>> total : 8 cables

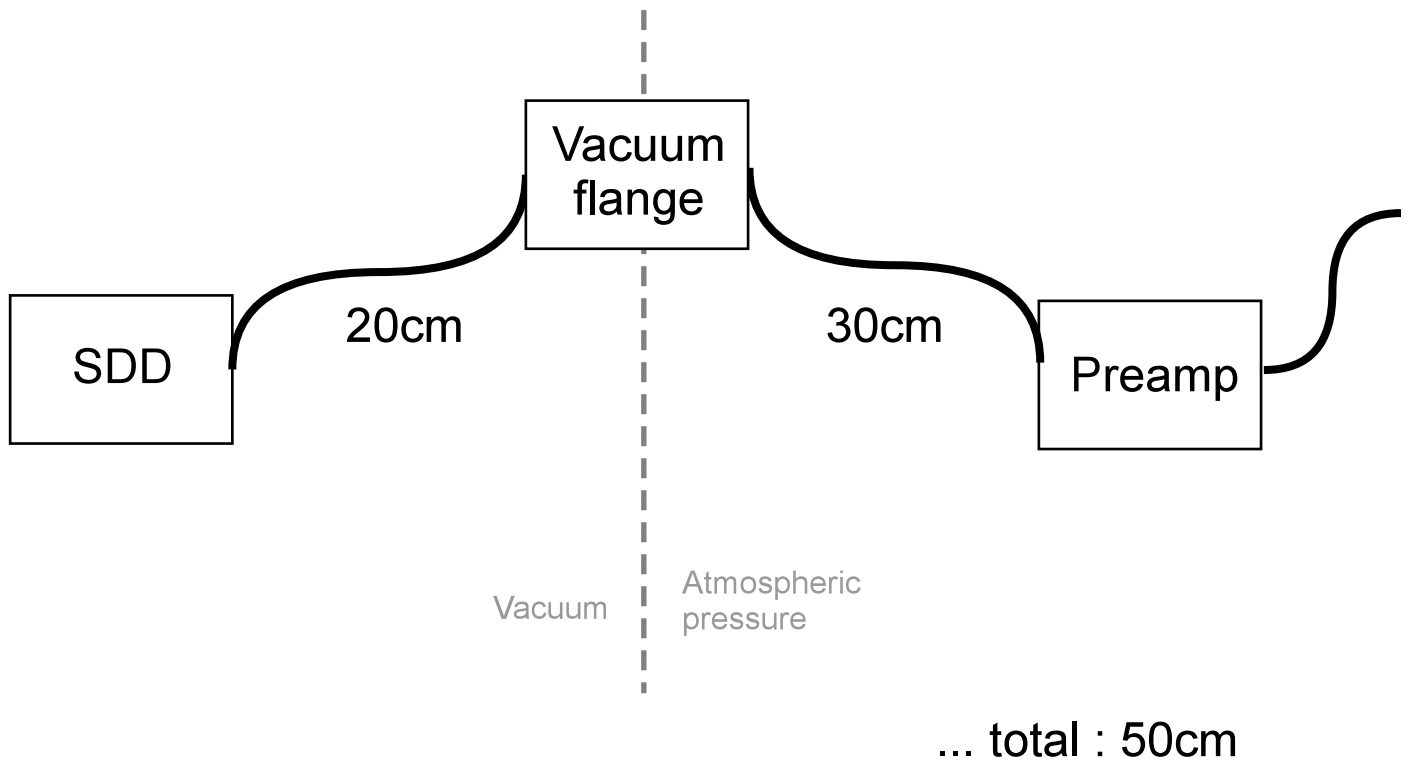
Cable for SDD

For signal (SRC,DR,FB, RST,SUB) : 5 cables
 For power supply (GND, RX,R1,BK) : 4 cables
 >>> total : 9 cables

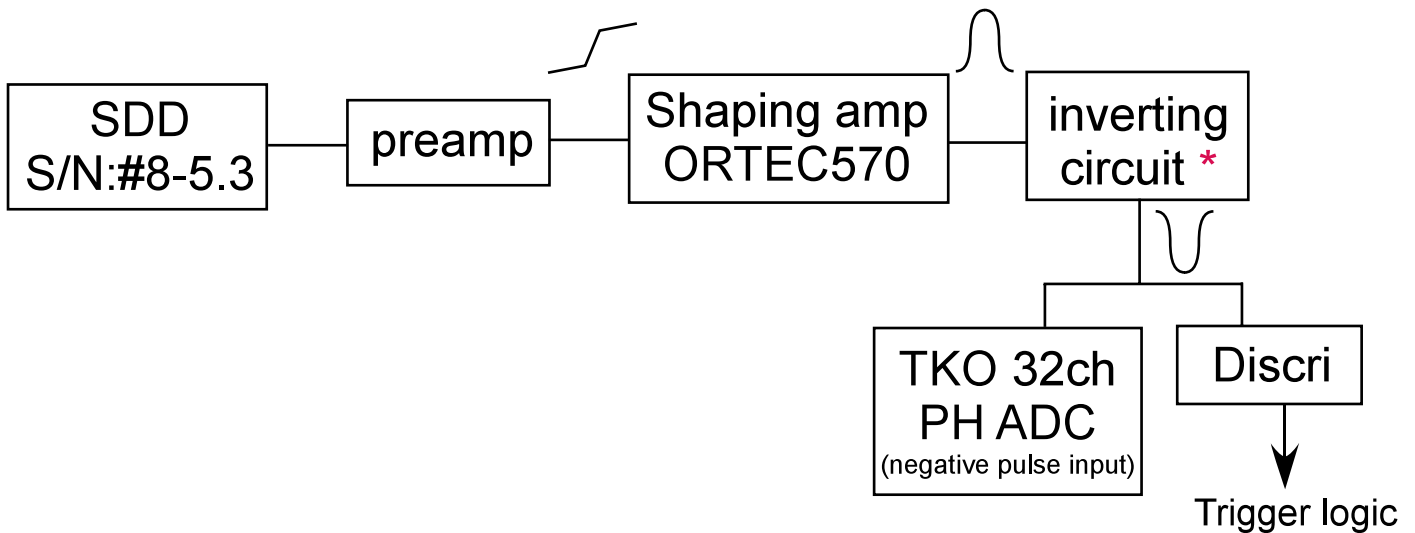
Preamp box

Voltage divider

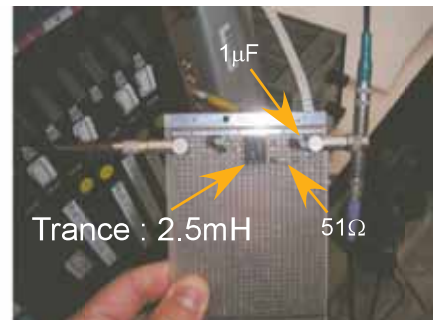
Cable length



Trigger logic



* To make trigger logic, we made a inverting circuit to reverse the positive output from shaping amp since we have no discriminator for positive signal.



Condition

SDD(preamp)
V(substrate) = -4.4V
V(reset) = 1.5V

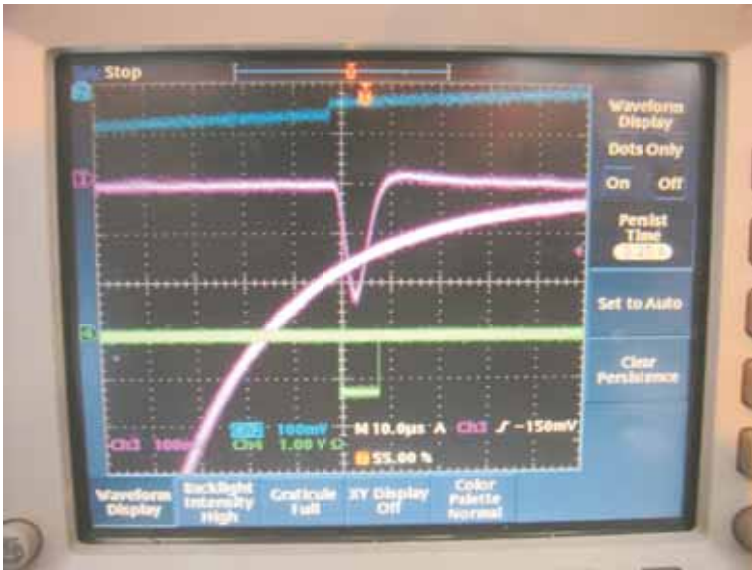
ORTEC570
Shaping time : 2µsec
Gain : ~ 100

Discri
Threshold = -30mV(min)

TKO 32ch PH ADC
Gate : 8µsec

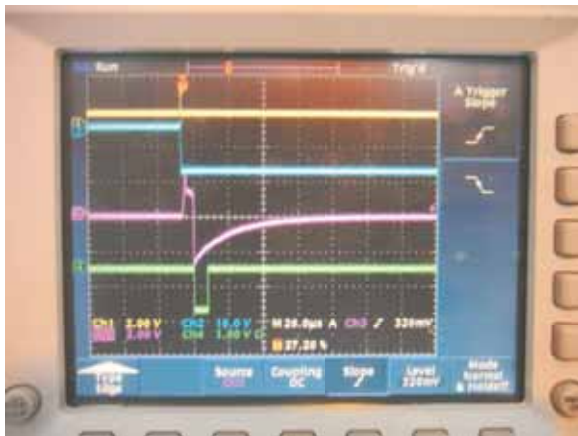
Trigger condition
... self trigger

Typical pulse shape

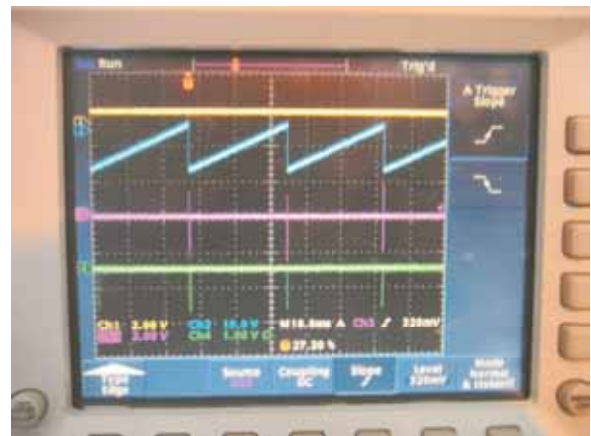


- 1 (yellow) : Reset pulse
- 2 (blue) : preamp output
- 3 (pink) : shaping amp output
- 4 (green) : ADC gate input

range : $10\mu\text{sec}$



range : $20\mu\text{sec}$

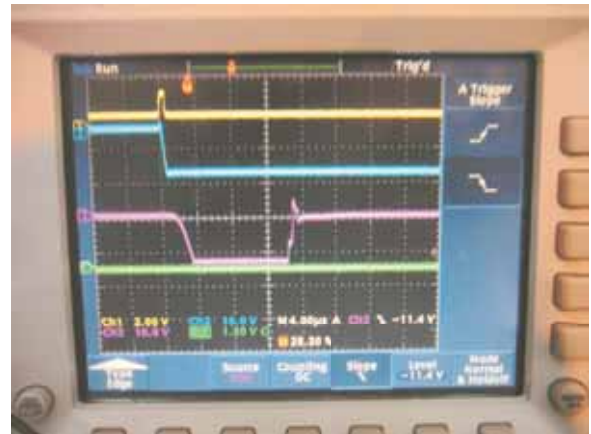


range : 10msec

range : $4\mu\text{sec}$



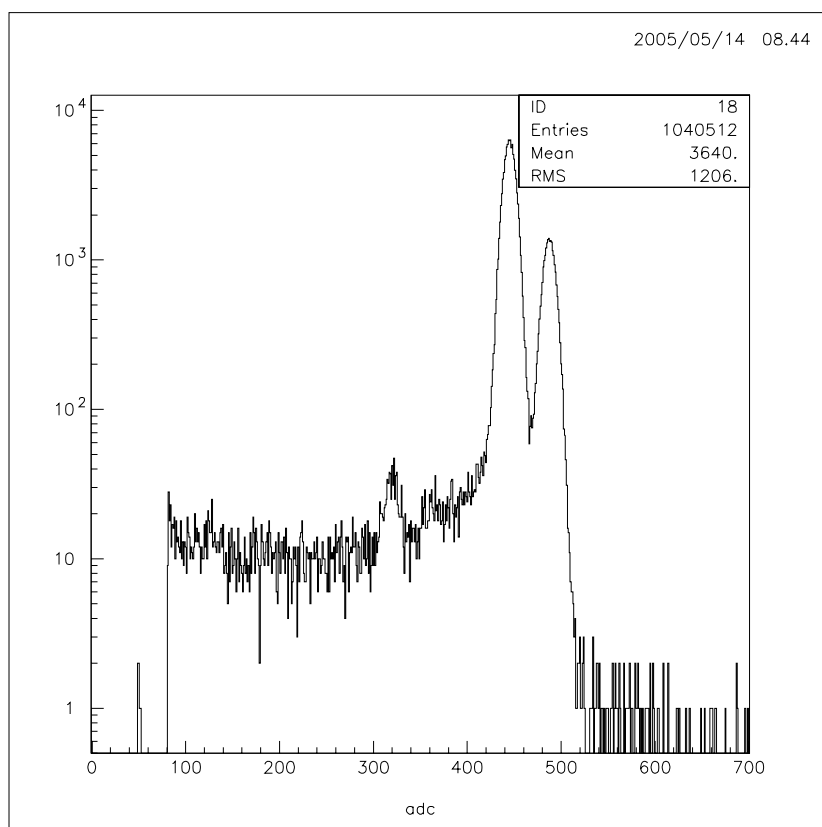
w/ inverting circuit



w/o inverting circuit

^{55}Fe source calibration

First spectrum at KEK



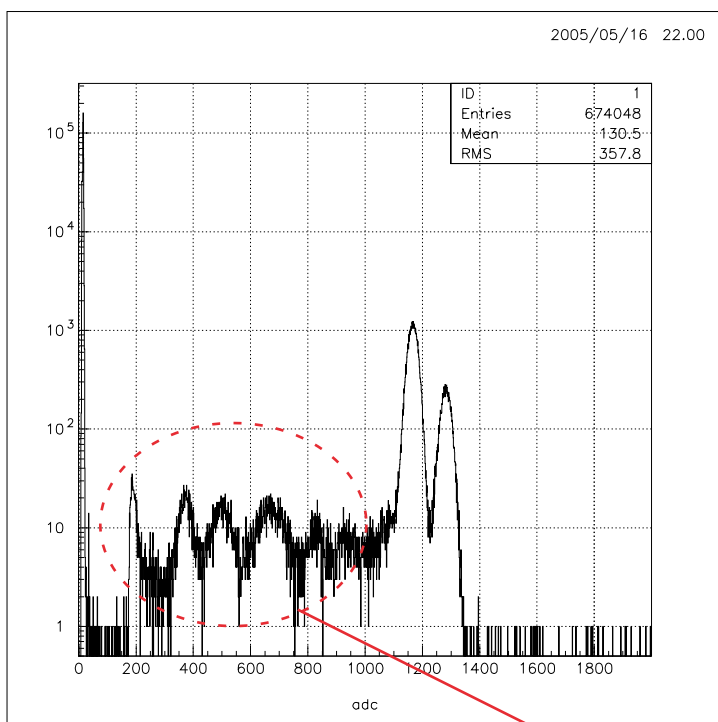
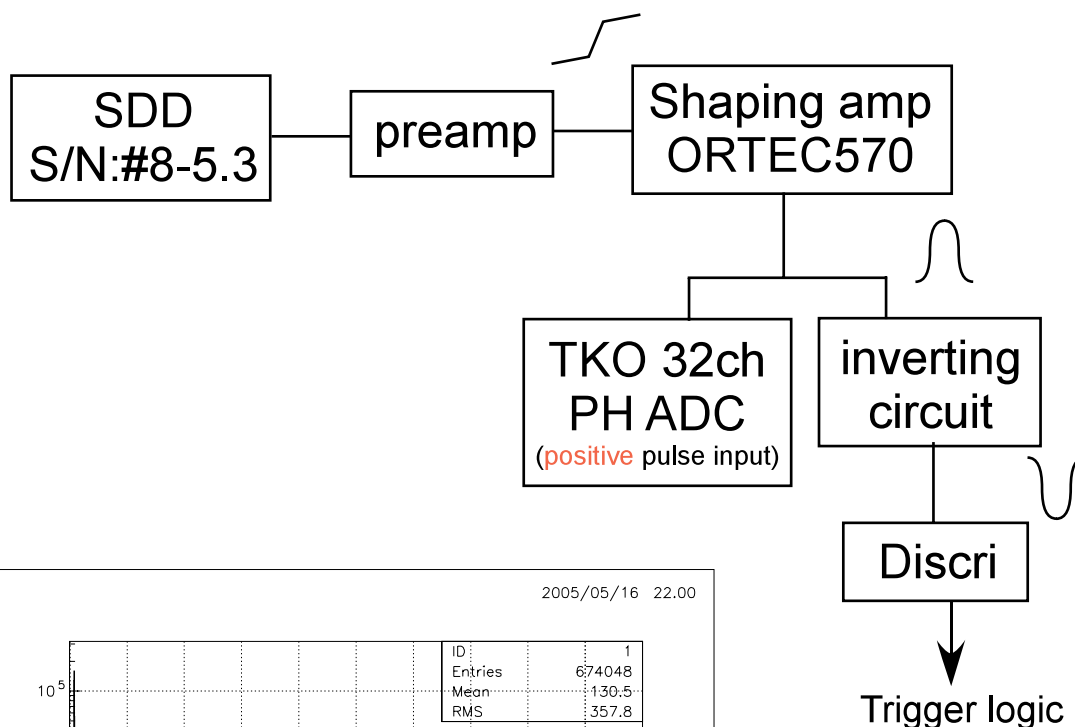
Mn $K\alpha$... $\sim 200\text{eV}$ (FWHM)

without temperature control
(turn on the cryostat all the while)
... temperature : 60~63K

Specification of TKO 32ch PH ADC

Analog input : 0 ~ 2.5V (or 0 ~ -2.5V)
Reset time : 800nsec
Conversion time : $< 100\mu\text{sec}$
ADC : successive approximation ADC
12bit (1ch... $\sim 5\mu\text{sec}$)

^{55}Fe source calibration with "positive pulse input" PH ADC



Shaping amp : gain = ~350
Discr : threshold = -100mV

@ temperature : 60~63K



These strange peaks are caused by dropped base line just after the reset pulse.

>>> need to consider vetoing while the base line is dropping.
... trigger level? offline?

Things to do list

- * preparing power supplier and coolant pipe for cryostat @K5
>>> submitted the request for support (asking Nobuaki-san)
- * preparing small scintillation counter
(>>> old segmented T0 counter (larger one)?)
- * preparing temperature controller <<< today's job.
(For test exp(@E549), we borrowed LakeShore340
from Ishimoto-san)
- * finding discriminator for positive input pulse
(>>> asking Matsuda-san)
- * finding Wilkinson-type ADC (for TKO, VME...)
- * considering reset pulse problem
- * ...

Shopping order

- * Ti , Ni foil ... thickness ~ 10 μm ?
(Nirako? Fuchikawa-kinzoku?)
ex) Ti : 0.02 * 120 * 100 mm (99.6%) ¥3, 800
- * Temperature controller ... LakeShore 340
(Toyo corporation ... ¥960, 000)
- * ...