

# Status of Aerogel Detector System

For High-pt upgrade team

BNL

CNS-Tokyo

Dubna

Tsukuba

DC meeting (Oct / 8 / 2003)

# HV isolation (Time consuming, but steady method)

**Was:**

- (i) the spark at btw. PMT, mu-metal shield, box  
(this is because we minimized total depth (R-direction)),  
and/or
- (ii) surface leak of the HV  
at the non-coating (we chose to avoid outgas)  
circuit board .

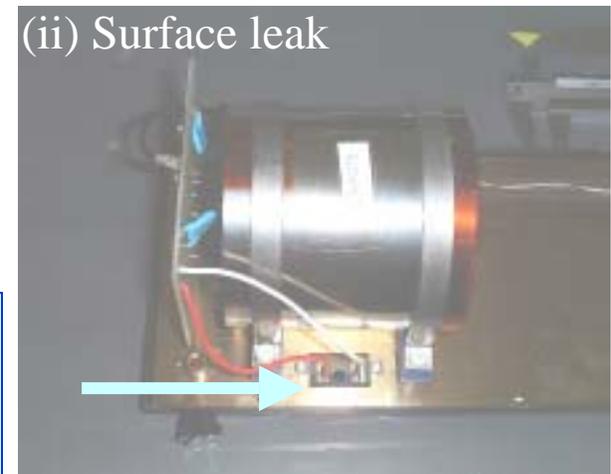
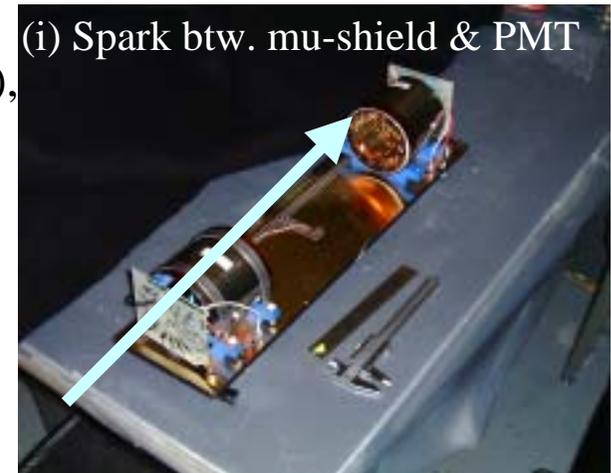
**Solution:**

- o Kapton, teflon between cathode and mu-metal,
- o mylar between mu-metal and box
- o Kapton between bleeder and box
- o RTV around input line

**Is**

**Well controlled, but time/manpower consuming.**

- o Single rate  $\sim 1$  kHz at HV operate ( $-1.5$  kV),  
which is **maxam voltage in specification.**  
but **coincidence of 2 PMTs is a few to a few tens Hz,**  
and box is  $< 1$  V.



# Each box assembling



Mechanical assembling,

which **needs to be in this order step 1 → 2 → 3.**

(Step 1) HV isolation (Time consuming, namely 1 PMT/hour/person)

- o Kapton, teflon around cathode, RTV around input line
- o **71boxes** / 80-boxes done

(Step 2) LED sorting/exchanging

- o Need to set resistance
  - In order to moderate voltage control,  
either at driver (**every 8 boxes**) or at LED (**every box**)
- o **Need to sort**, because LED voltage can be set in every 8 boxes
  - Because outputs are varying from  $< 1$  p.e. to several tens p.e.

(Step 3) Light shielding, Gas shielding

- o **Taping** between lid and box (light, gas)
- o Epoxy (one night to be solid) around screws and gas connector (gas)
- o  $N_2$  (In:  $\sim 1.1$  atm,  $\sim 0.25$  liter/min/box  
→ Out: 0.01 inch  $H_2O$ ,  $< 0.025$  liter/min/box (depending on the box))

**Step 2 is now speed limitation,**

while number of people decreases:

Last week Titiana, Vradimir back to Dubna, Satoshi back to Tsukuba,

This week Anatory back to Dubna,

Next week Maya back to Tsukuba, after their intensive works in day-night

# Preparation of integration at Bldg.510-1F-highbay (and at BNL)

[Status as of Oct/8/8am]

## [For north] (1) In BNL, at Bldg-510 High-bay (for W1-north)

- [ 0/80] - Each box needs to be “step-1 to 3”ed (in the previous slide).
- [20/20] - Already, 20 Preamps (for 80 boxes) are ready to mount.
- [1/8] - Today, 1 HV cable (out of 8 cables, for north) is ready.  
The rest will be faster owing to the first cable.
- [50/80] - Signal cables (PMT to Preamp) for ~50 boxes (out of 80 boxes, for north) is ready. Rest will be ready in a few days.
- [0/8] - Today gas manifolds (8 out of 8, for north) will be ready to mount.
- [10/80] - T-shape gas connectors for output on box are 10 in hand out of 80 (the rest are in a day or so).
- [0/80] - Black gas tubing need to be delivered to 510 high-bay.

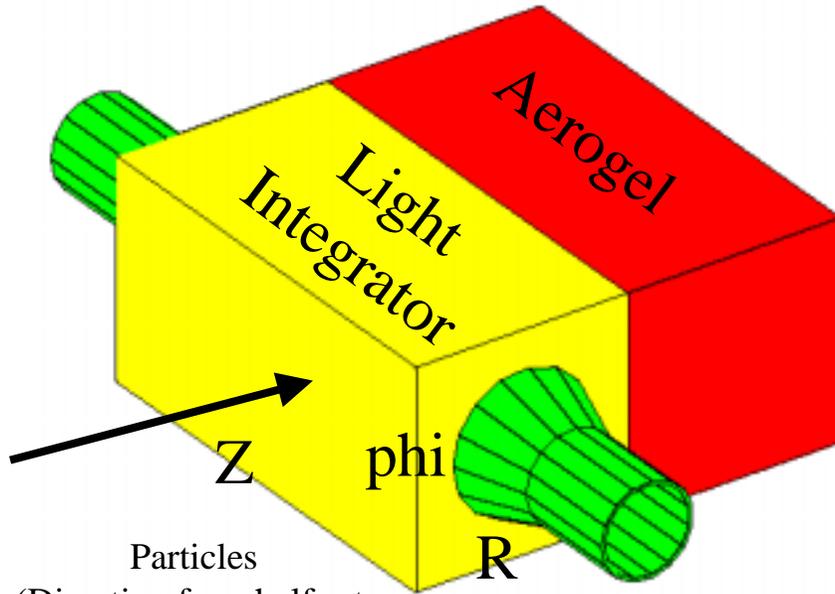
## (2) In BNL

- [5/5 north + 5/5 south] - FEM in hands for 160 boxes,
- [1/1 north] - 1 FEM crate (for 80 boxes)
- [0/20 north] - In a few days, 20 power line of preamp (for 80 boxes) will be made.
- [80/80 north] - Signal cable (Preamp to FEM) (for south 80 will be completed in the beginning of Nov.)



**FYI**

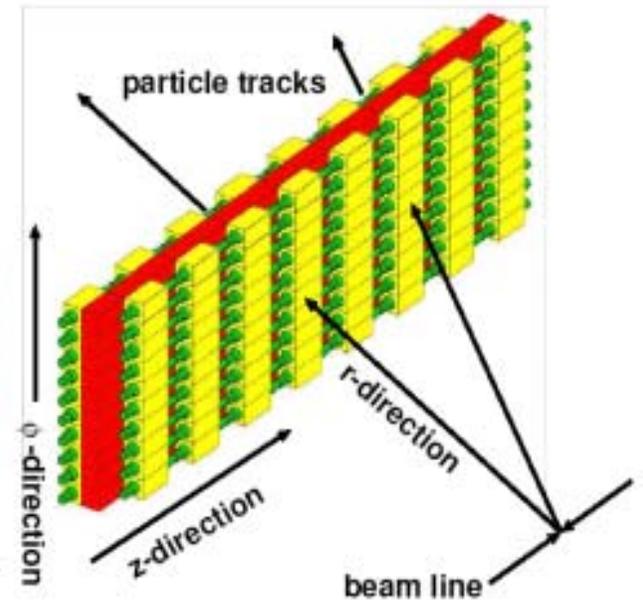
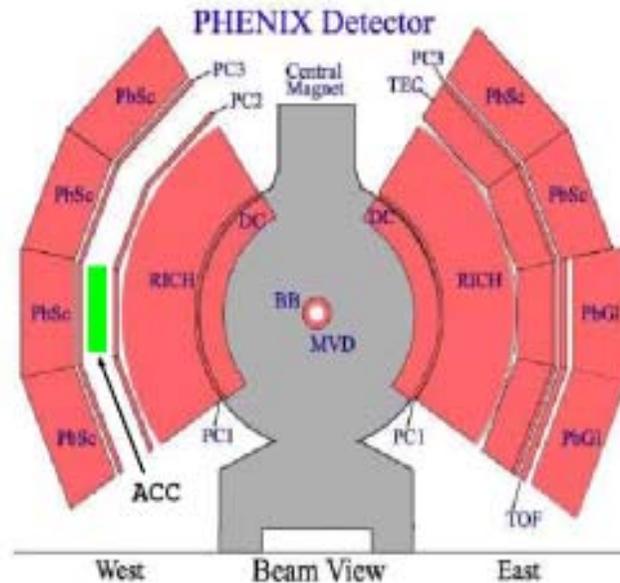
# Aerogel detector (1)



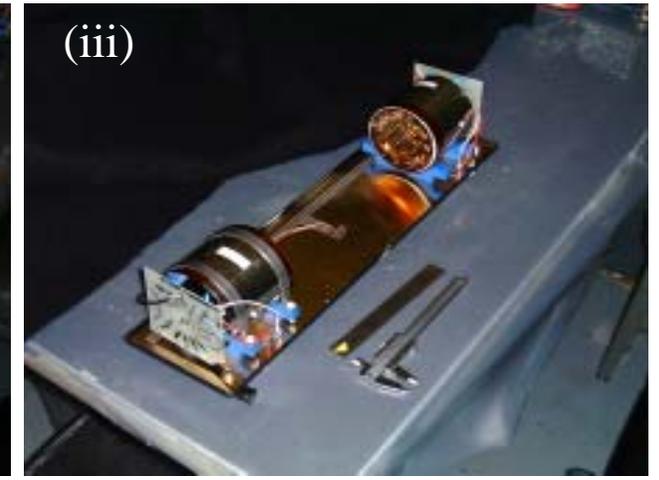
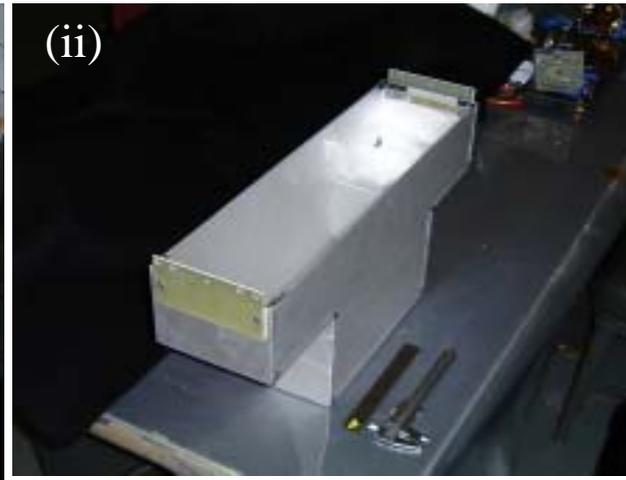
22(z) x 11(phi) x 12(r) cm<sup>3</sup>  
with 22 (2 in z, 11 in phi) tiles

Particles  
(Direction for a half set,  
the other half in opposite.)

80 boxes in north (1<sup>st</sup>), and  
80 boxes in south (2<sup>nd</sup>)



# Aerogel detector (2)



(i) Aerogel in Gore-tex box,

(ii) then put into Al-box,

(iii) and put the lid w/PMTs&LED