

Characteristics Measurements of Scintillation Counters for Point 2 Cosmic Trigger

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Expected Cosmic Rate

(from Particle data book)

- total cosmic fluxes in the sea-level is

$$170(\mu^+, \mu^-) / \text{m}^2 \text{s} + 70(e^+, e^-) / \text{m}^2 \text{s} = 240 / \text{m}^2 \text{s}$$

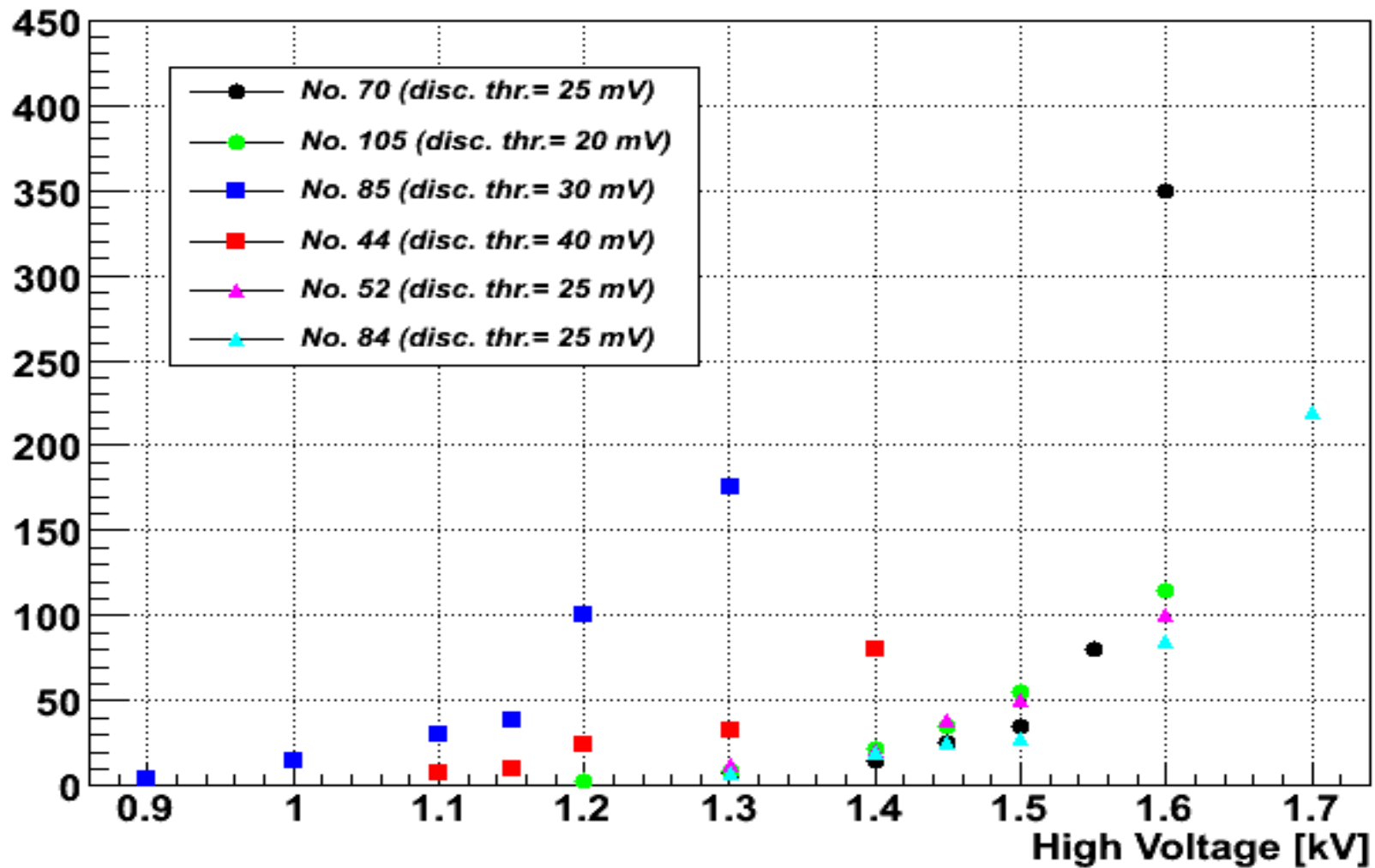
- scintillator size

$$\sim 60\text{cm} * 10\text{cm} = 0.06\text{m}^2$$

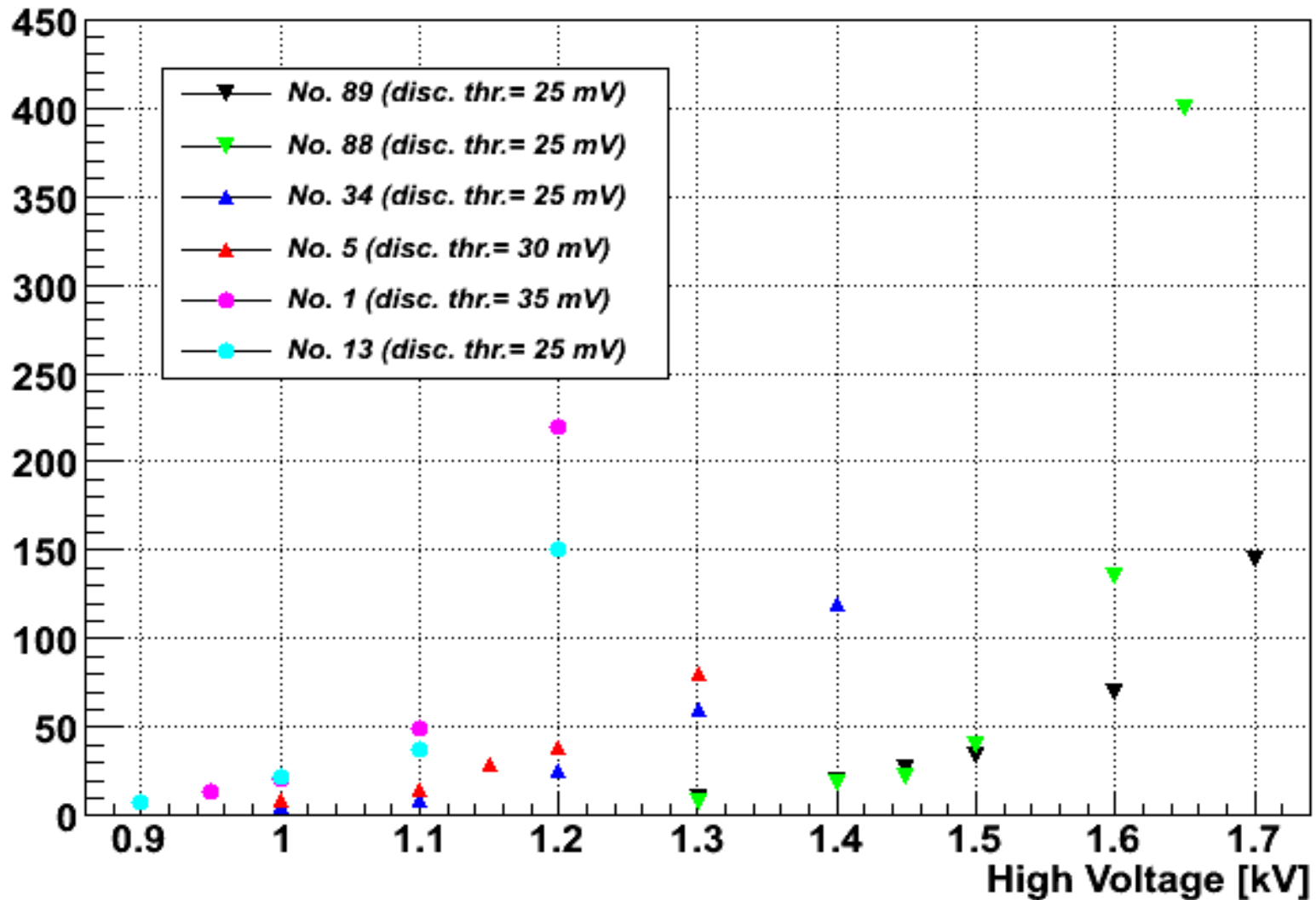
- Cosmic rate

$$0.06\text{m}^2 * 240 / \text{m}^2 \text{s} = \underline{14\text{Hz}}$$

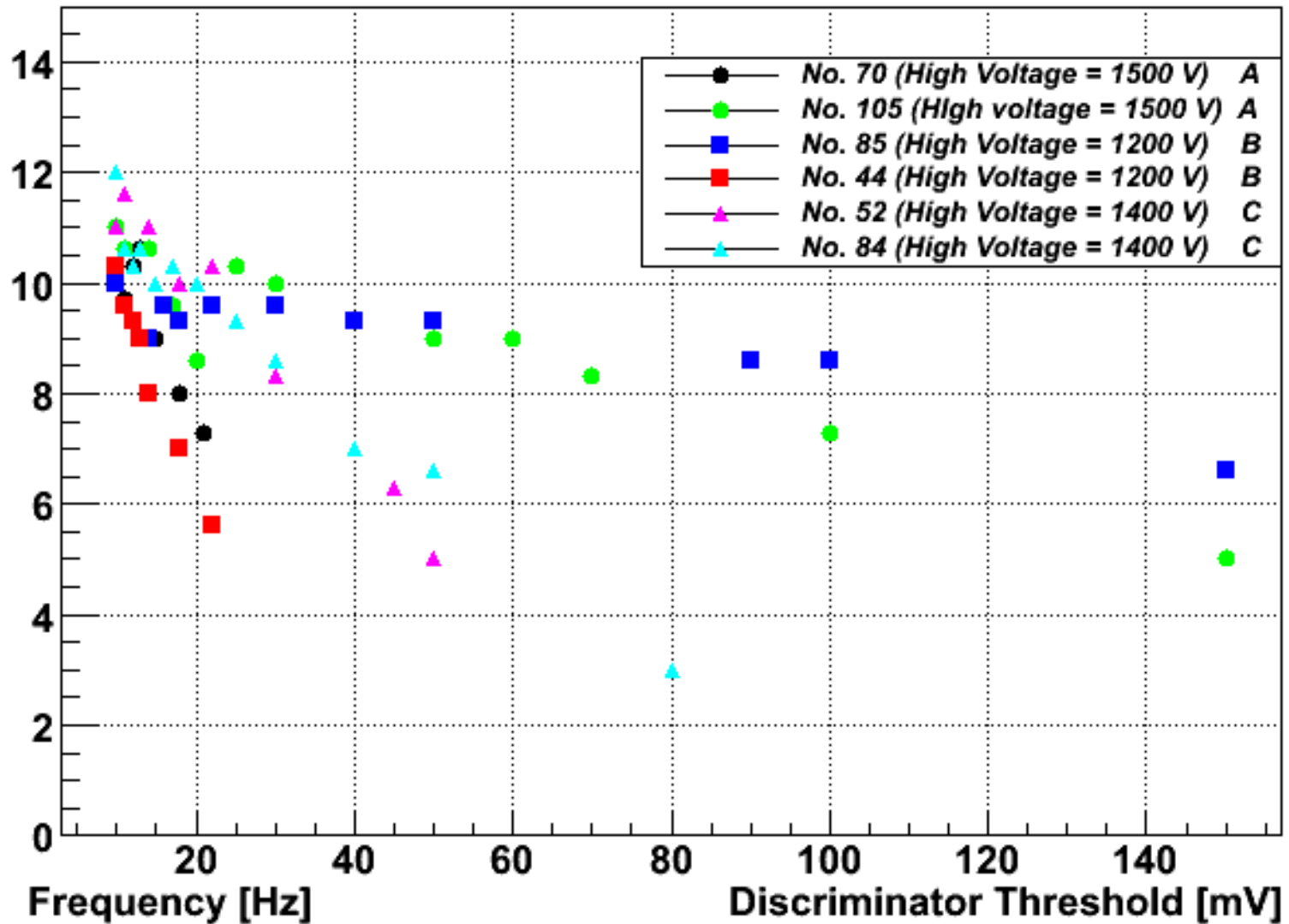
Driving HV vs. Signal Rate (1)



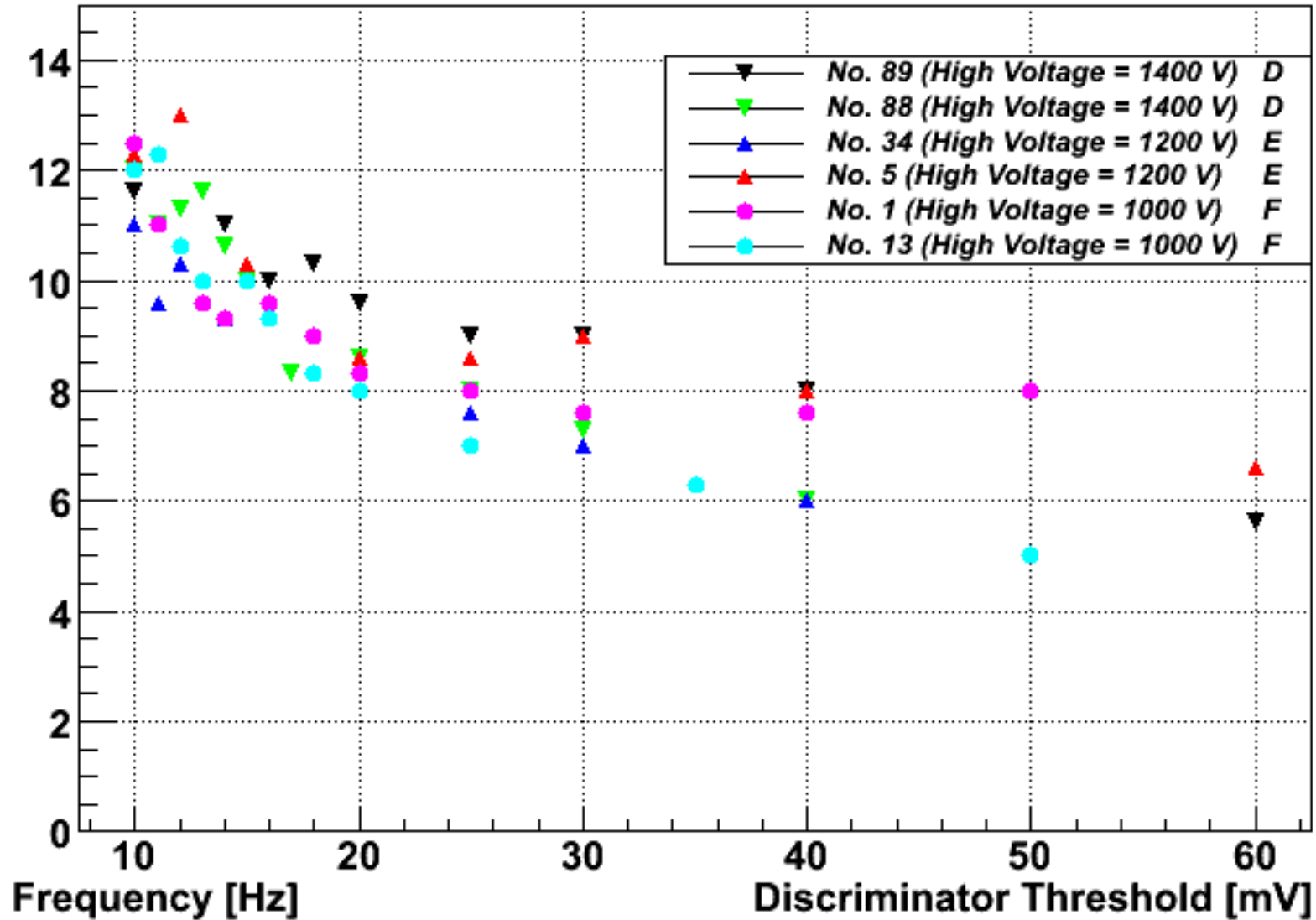
Driving HV vs. Signal Rate (2)



Coincidence Rate (1)



Coincidence Rate (2)



Discriminator Threshold and High Voltage Settings

Scintillation Counters	High Voltage (kV)	Discriminator Threshold (mV)
No. 70	1.5	10
No. 105	1.5	10
No.85	1.2	10
No. 44	1.2	10
No. 52	1.4	10
No. 84	1.4	10
No. 89	1.4	10
No. 88	1.4	10
No. 34	1.2	10
No. 5	1.2	10
No. 1	1.0	10
No. 13	1.0	10

Conclusion

- There are twelve scintillation counters = six “sandwiched” scintillation counters
- Defined high voltage levels supplying to photomultiplier (1.0 - 1.5 kV according to scintillation counters)
- Defined discriminator thresholds ($>10 < 100$ mV according to photomultiplier)
- Need for adapted box because scintillation counters are not stable (there have to be a very good contact between photomultiplier and scintillator!)

Next Step

- To drive different HV into the scintillation counters, we have a plan to get 32 channel HV PS from Anton (he need to find out how to unlock it)
- MinJung will check coincidence rate with all twelve scintillation counters with the setup when it is assembled