

NPS 8-Stage Active HV Divider - Summary

Table 2: Measured divider ratios

	K- Dy1	Dy1- Dy2	Dy2- Dy3	Dy3- Dy4	Dy4- Dy5	Dy5- Dy6	Dy6- Dy7	Dy7- Dy8	Dy8- Dy9	Dy9- Dy10	Dy10- GND
Active	1.8	1	1	1	1	1	1	1	2	4.3	3.5
Hamamatsu	1.4	1	1	1	1	1	1	1.2	1.8	3.3	3.1

- *Dynodes 9 and 10 are connected to Anode and no amplifier for the following tests.*
- *Preserved PMT biasing of other electrodes (see above table).*
- *Test Results (Vladimir, Carlos, Chris):*
 - *PMT Gain $\sim 2 \times 10^3$ (with reference to Hamamatsu divider: 10^5 @1.1kV).*
 - *HV: 630 V @ 405 μ A.*
 - *Source (LED, Laser): set at 10% of maximum expected in the experiment.*
 - *Signal Amplitude = 7 mV nominal (10% of maximum).*
 - *Residual Noise = 2.5 mV peak.*

PMT Biasing

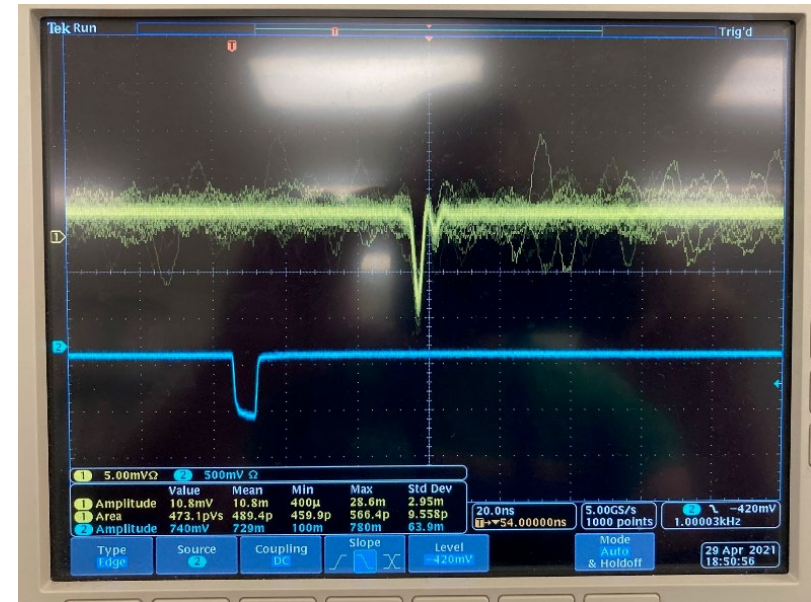
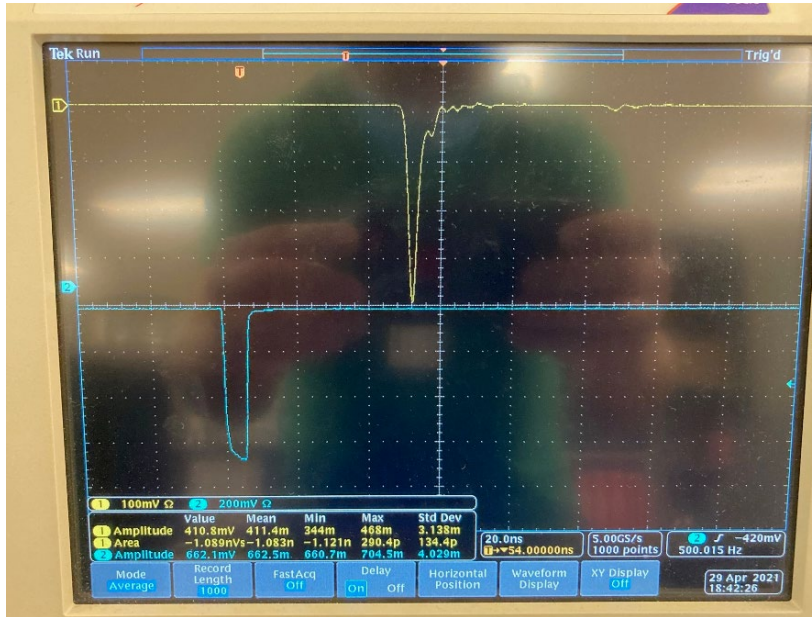
- **Hamamatsu: 1100 V @ 192 μ A**
- **NPS 8-Stage: 612 V @ 405 μ A**

- **Potential differences at each electrode referenced to ground.**
- **Delta (V) – inter-electrode potential differences.**
- **Ratio – Delta (V) ratios.**

	K	Dy1	Dy2	Dy3	Dy4	Dy5	Dy6	Dy7	Dy8	Dy9	Dy10-A
Hamamatsu	1100	1004	941	877	814	750	687	623	548	433	208
Delta (V)	96	63	64	63	64	63	64	75	115	225	208
Ratio	1.5	1	1	1	1	1	1	1.2	1.8	3.5	3.2
	K	Dy1	Dy2	Dy3	Dy4	Dy5	Dy6	Dy7	Dy8-A		
NPS 8-Stage	591	484	430	376	322	268	214	161	107		
Delta (V)	107	54	54	54	54	54	53	54	107		
Ratio	2	1	1	1	1	1	1	1	2		

- **Signals at 10% of maximum:**
- **Hamamatsu**

NPS 8-Stage



- **Anode Current:**
 - 1.5×10^{10} ph.e./s (Bogdan's estimate).
 - **PMT Gain $\sim 2 \times 10^3$.**
 - **Average Anode Current = 4.8 μ A.**
- **Signal:**
 - **Signal Amplitude = 7 mV (10% of maximum) \rightarrow Maximum = 70 mV (no amplifier).**
- **Amplifier Gain Needed:**
 - **fADC250 2 V Scale: $\sim x30 \rightarrow$ 2-stage, <200 mW.**
 - **fADC250 1V Scale: $\sim x15 \rightarrow$ 1-stage, ~ 100 mW.**

- Proposed divider simplified:

