

DUNE Diamond Update

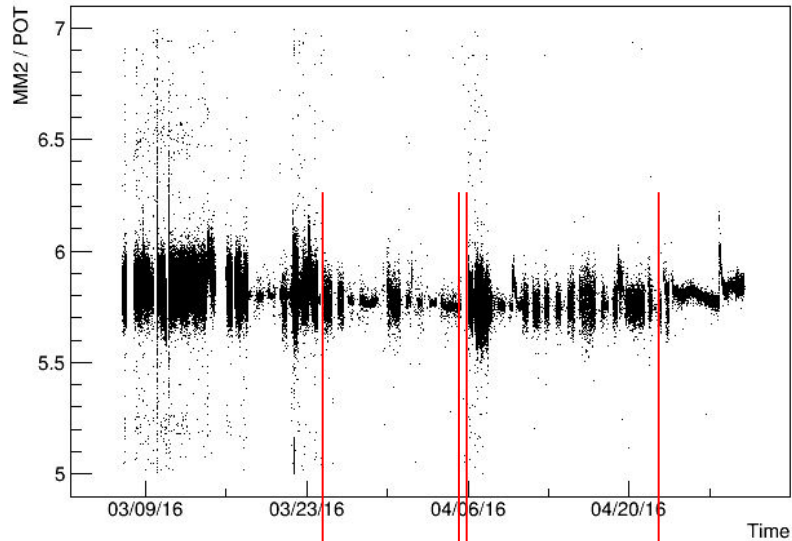
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6-30-2016

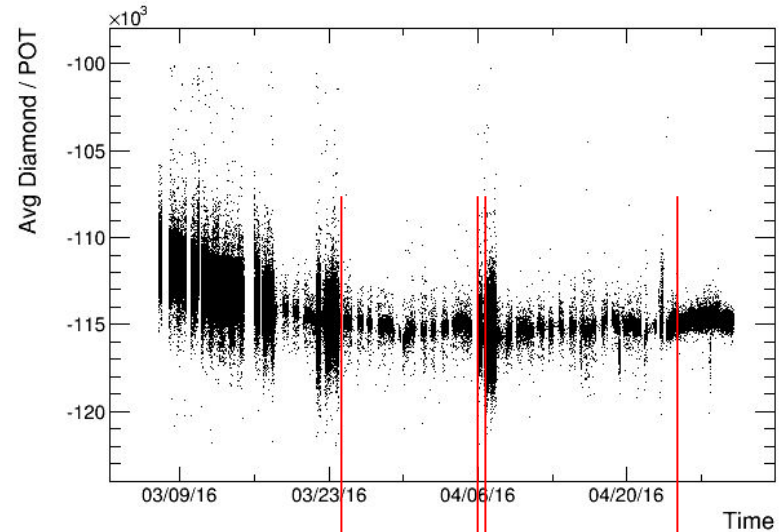
March-April 2016

Muon Monitors



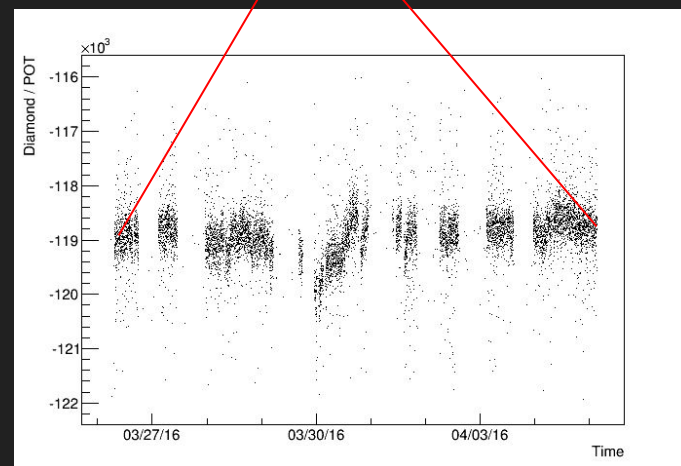
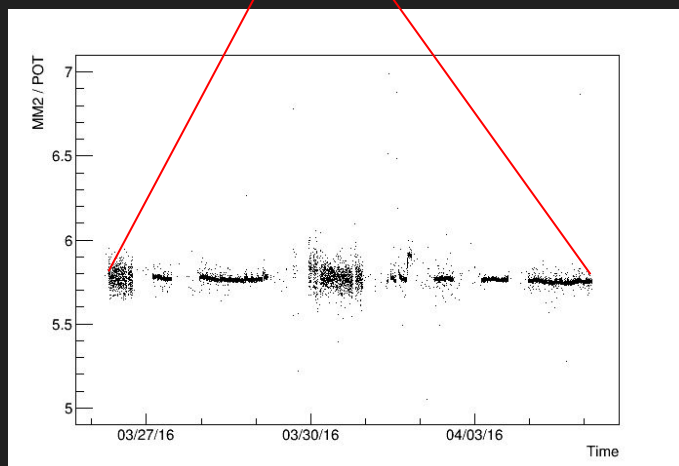
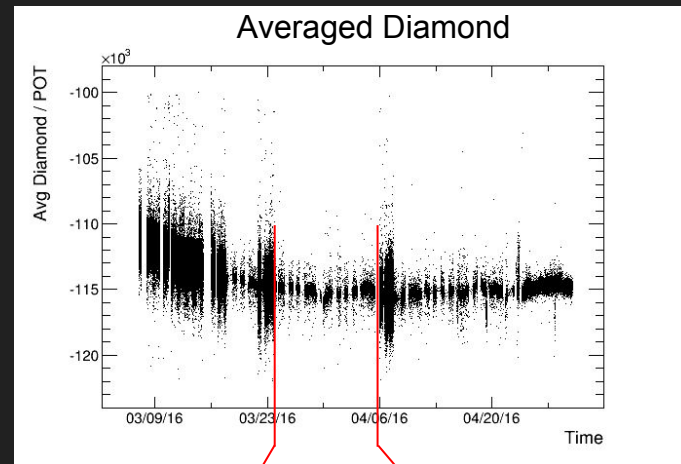
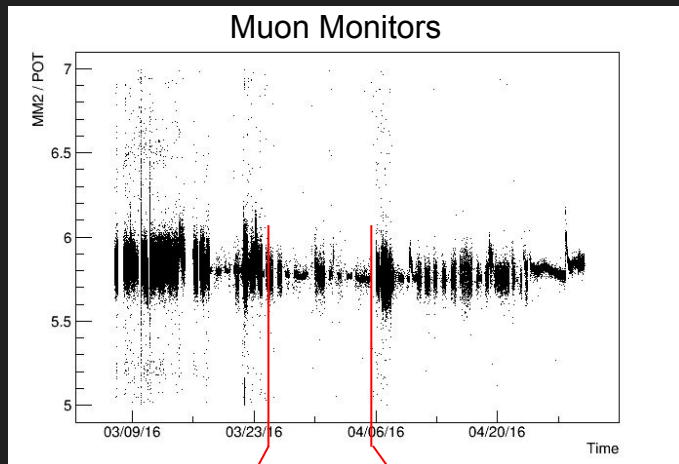
Time 1 ~10 days
Time 2 ~16 days

Averaged Diamonds

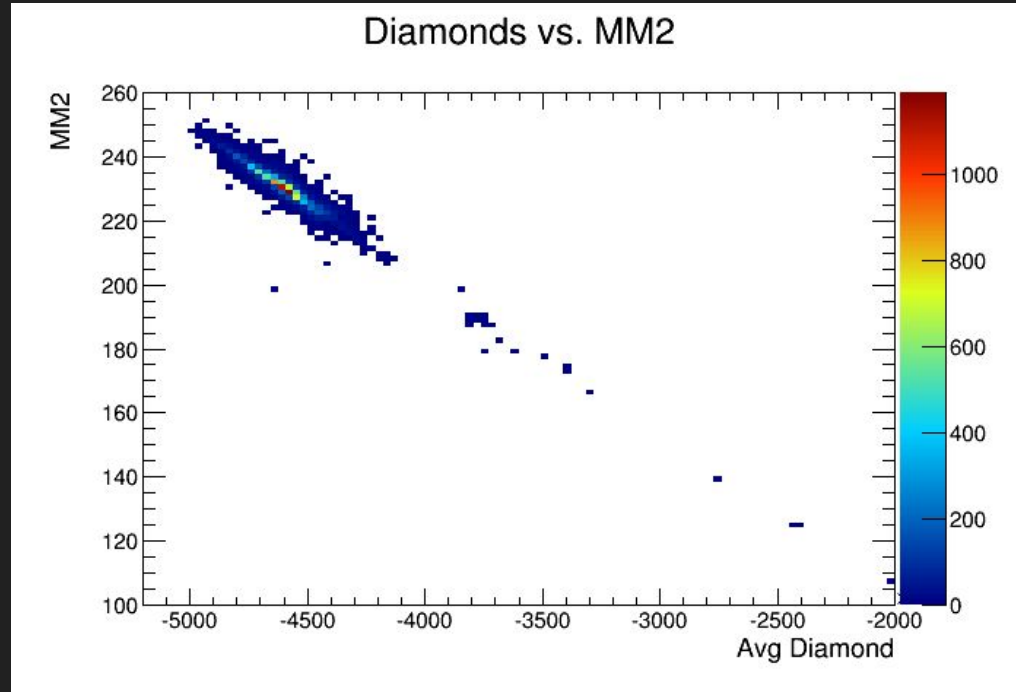


Time 1 ~10 days
Time 2 ~16 days

Time 1: 10 days

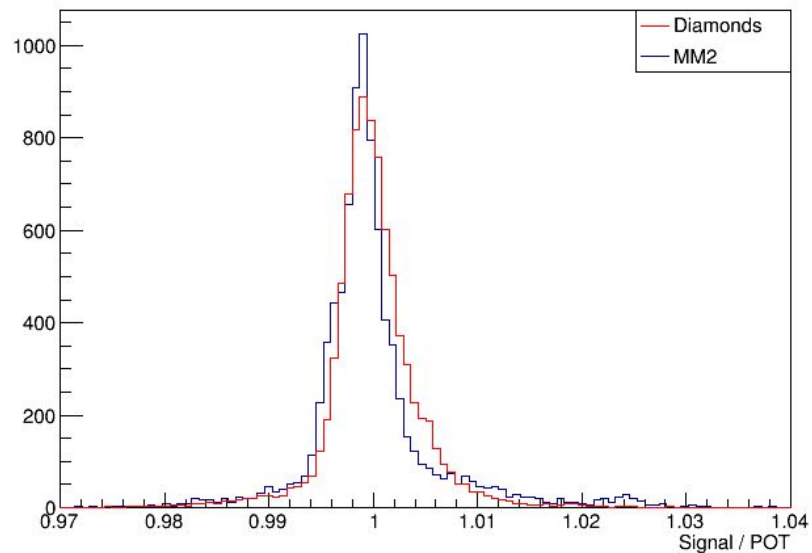


Time 1: 10 days

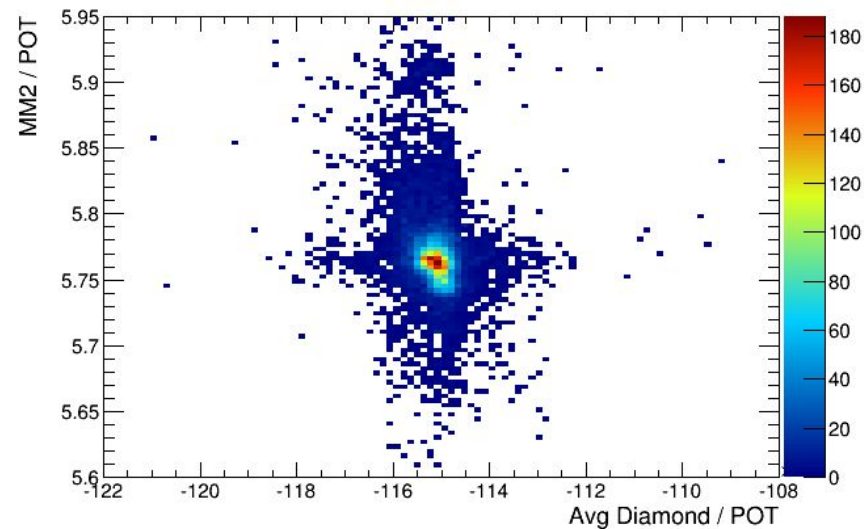


Muon monitor 2 and the averaged diamond signal are highly correlated as expected. They are both measuring results of PoT.

Time1: Diamonds vs. MM2

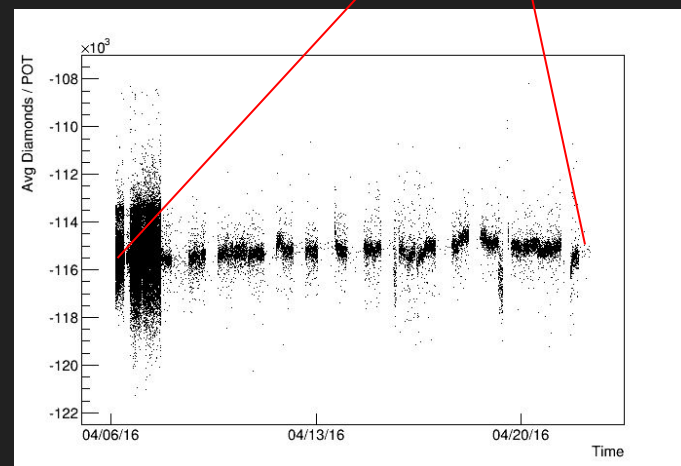
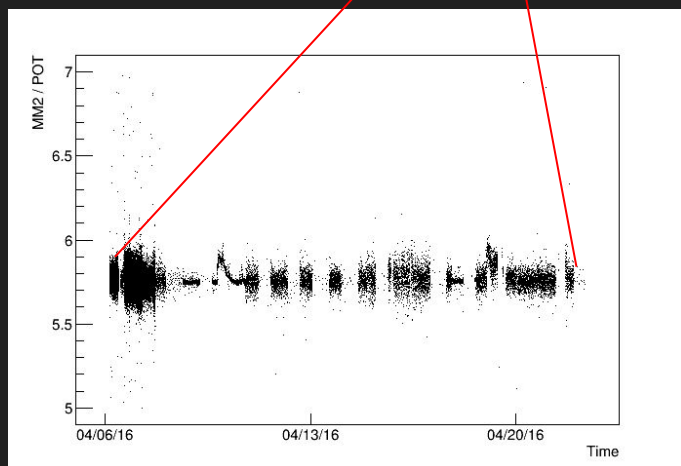
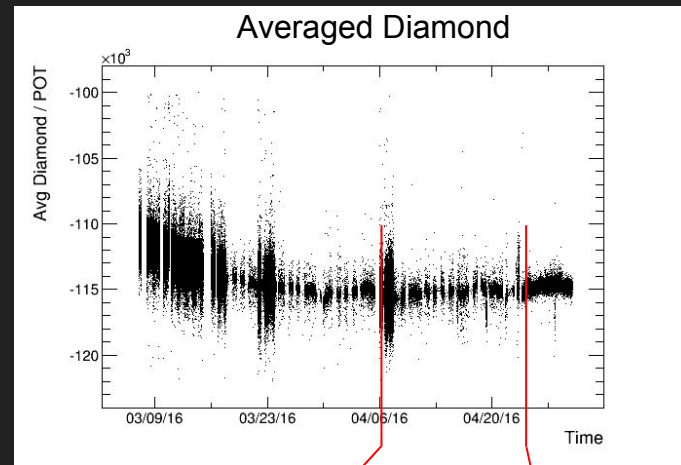
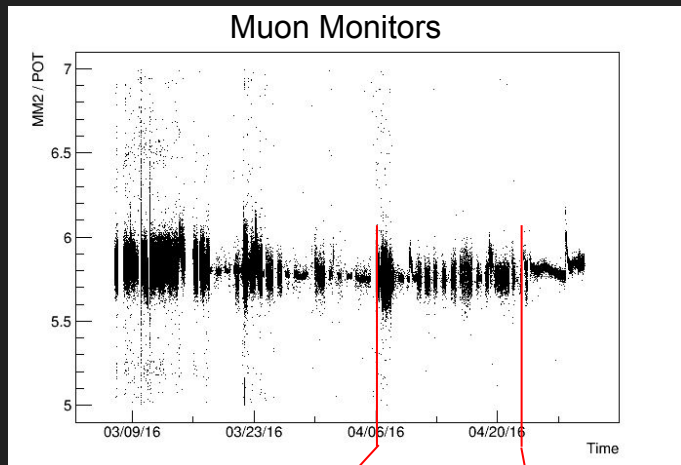


- Average diamond signal and muon monitor signal normalized by POT
- Divided by mean signal

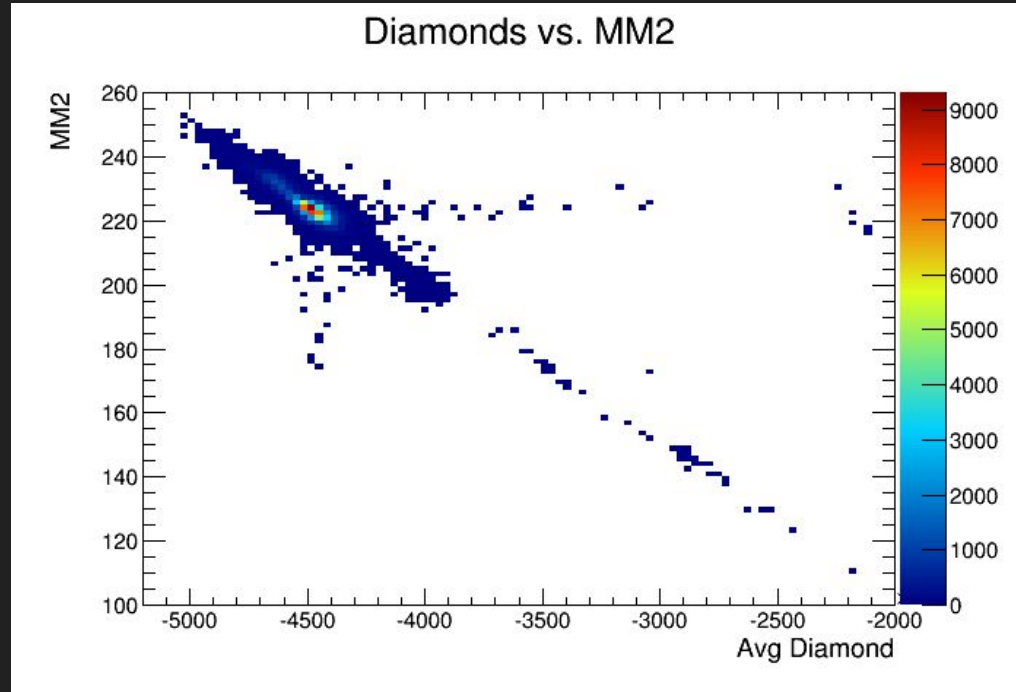


- Correlation coefficient: -0.21

Time 2: 16 days

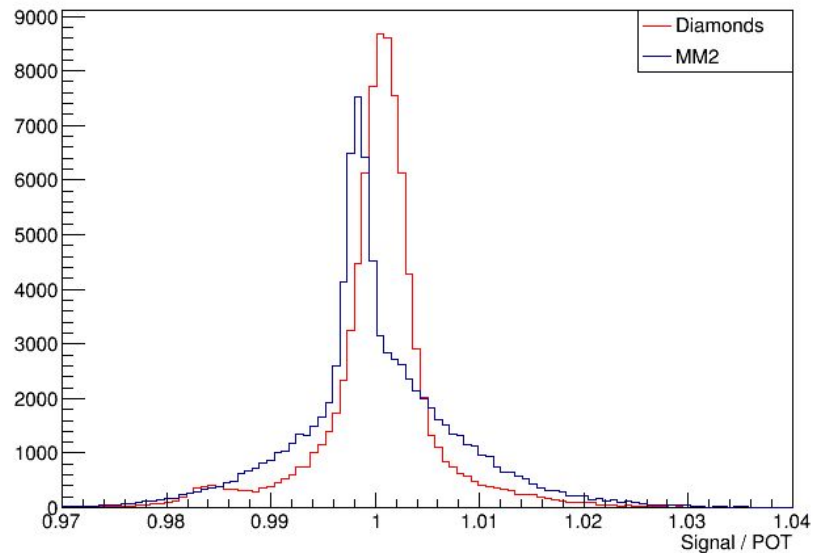


Time 2: 16 days

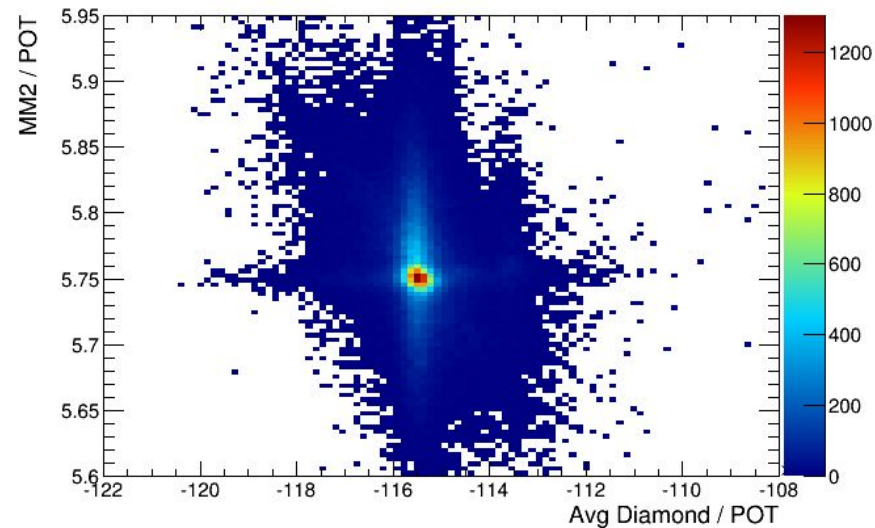


Muon monitor 2 and the averaged diamond signal are again highly correlated as expected. They are both measuring results of PoT.

Time2: Diamonds vs. MM2



- Average diamond signal and muon monitor signal normalized by POT
- Divided by mean signal



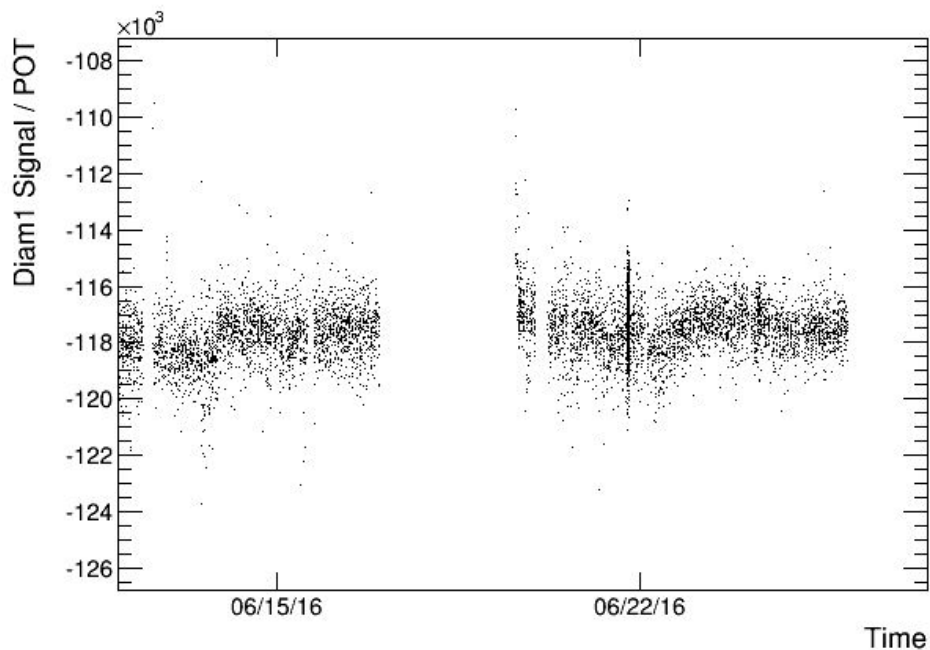
- Correlation coefficient: -0.26

Continuing “Turn On” Study

We had seen a 20-day-long exponential rise in signal after long periods of the diamonds being off.

The diamonds were turned off over a few-day period to check if there was an exponential rise after a short time.

There appears to be a very short trend here, but requires more investigation.



Future Plans

- See how signal changes in anti-neutrino mode
- Turn diamonds off for longer period of time
- Starting to work on prototype diamond hardware