

Temperature dependence of scintillator light yield

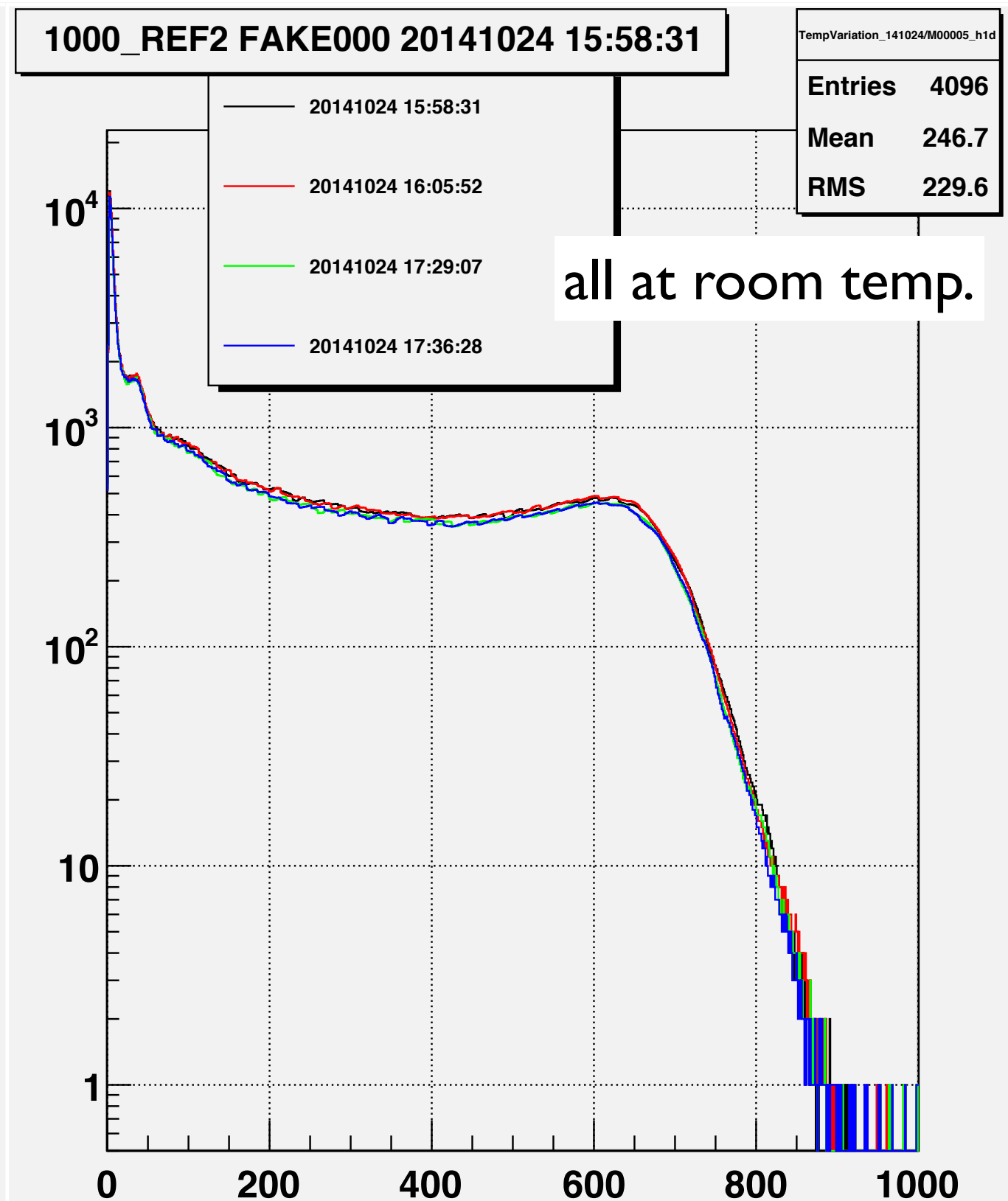
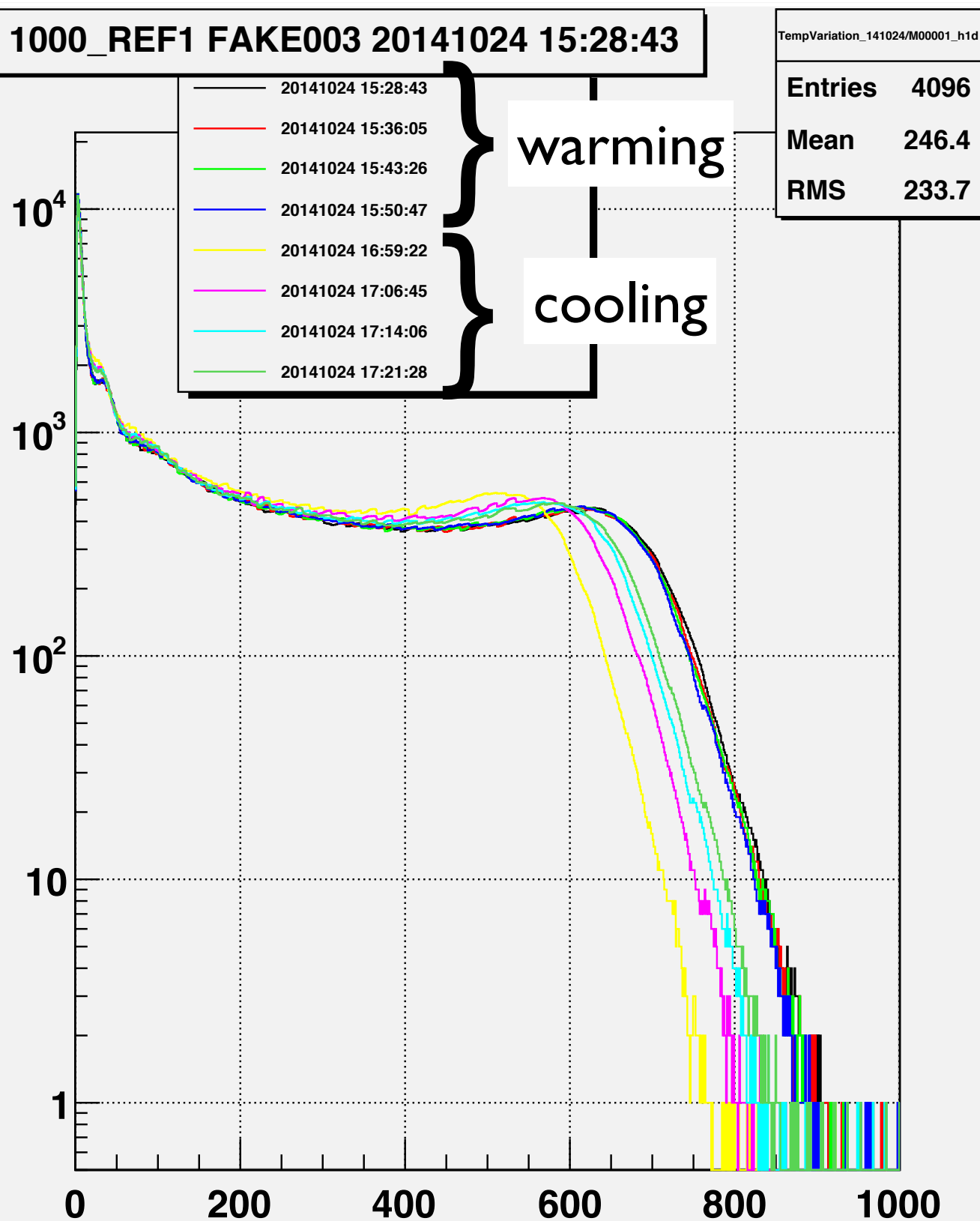
20141027 D.Jaffe

Data description

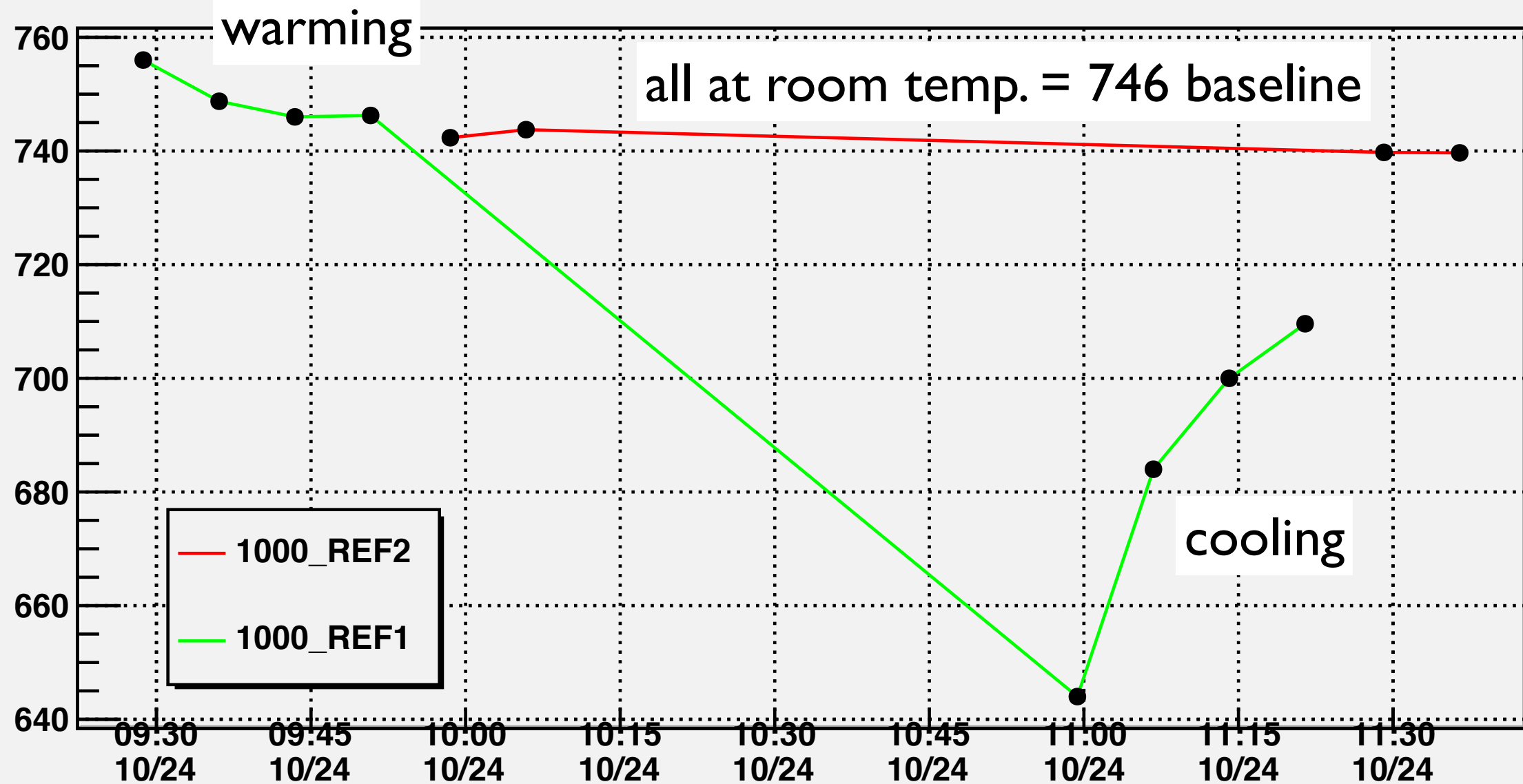
- Lindsey cooled and heated 100% LS samples without/with antioxidant. Analyzed non-antioxidant samples.
- Less than ideal temperature control and knowledge of temperature

Measurement Number	SampleID	Notes
1	1000_REF1	Started ~0 C, warming
2	1000_REF1	Started ~0 C, warming
3	1000_REF1	Started ~0 C, warming
4	1000_REF1	Started ~0 C, warming
5	1000_REF2	Room Temperature
6	1000_REF2	Room Temperature
7	1002_REF1	Started ~0 C, warming
8	1002_REF1	Started ~0 C, warming
9	1002_REF1	Started ~0 C, warming
10	1002_REF1	Started ~0 C, warming
11	1002_REF2	Room Temperature
12	1002_REF2	Room Temperature
13	1000_REF1	Started ~50 C, cooling
14	1000_REF1	Started ~50 C, cooling
15	1000_REF1	Started ~50 C, cooling
16	1000_REF1	Started ~50 C, cooling
17	1000_REF2	Room Temperature
18	1000_REF2	Room Temperature

Measured spectra 100%LS

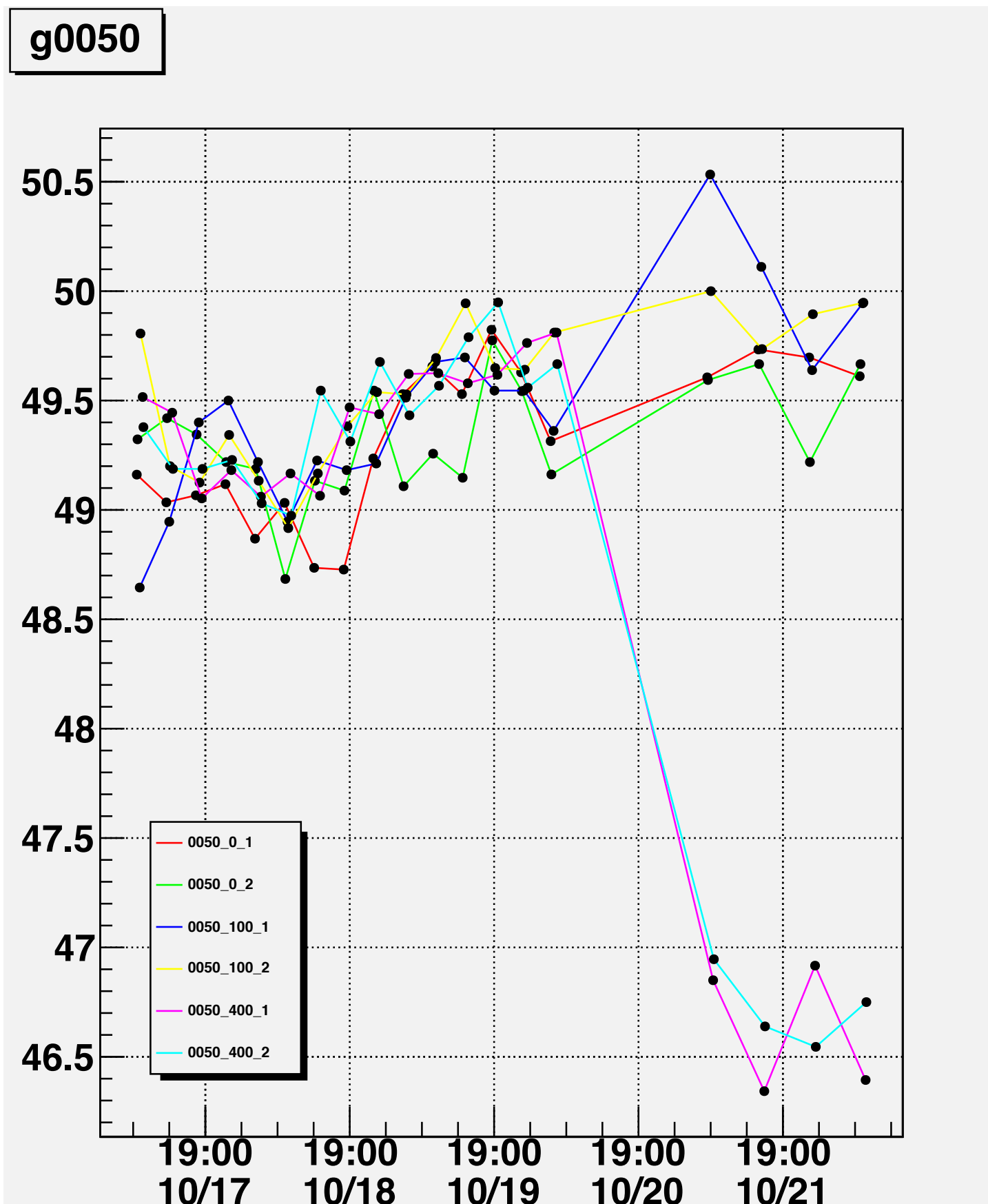


g1000



- warming:
 - $10/746 = 1.34\%$ decrease in LY
 - $-0.07\%/C$ assuming 20C temp. change
- cooling
 - $100/746 = 13.4\%$ increase in LY (assuming it recovers to baseline)
 - $+0.45\%/C$ assuming 30C temp. change

gamma irradi. samples



- Roughly 1 count/50 counts variation attributed to temperature $\sim 2\%$
- At $0.45\%/C$ ($0.07\%/C$) this implies a temperature variation of $4.4C$ ($28C$)
- Need better controls when repeating study