



QA on F/T Ratio for Six Cube Samples from Saint-Gobain

Ren-Yuan Zhu

California Institute of Technology

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Introduction



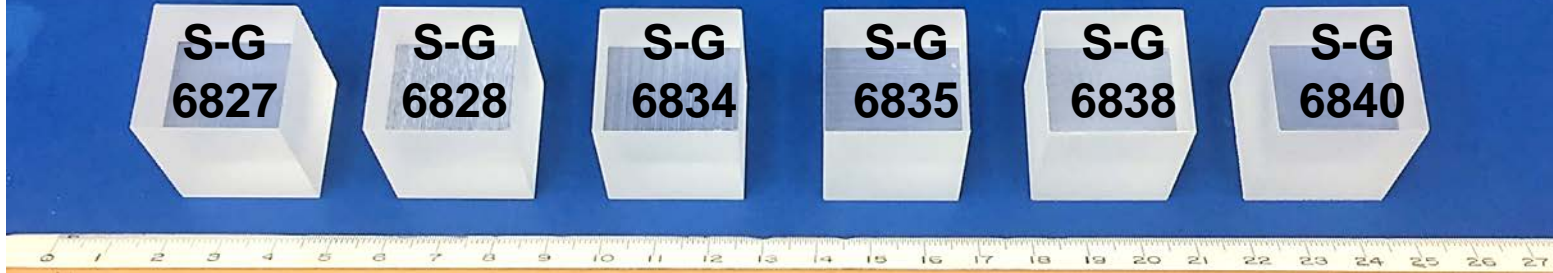
- Six 1" cube Saint-Gobain CsI samples arrived Caltech. They are cut from different ingots at a level where the final crystals will be cut. Their F/T ratio has been measured at Caltech, and compared to Saint-Gobain data.
- Excellent correlation is found between the Caltech data and the Saint-Gobain data.
- Will measure their radiation hardness together with selected pre series CsI crystals from SIC.



Six Cube Samples from Saint-Gobain



All samples have one polished surface



| ID | Dimension (in ³) | Polishing |
|----------|------------------------------|-----------|
| S-G 6827 | 1x1x1 | One face |
| S-G 6828 | 1x1x1 | One face |
| S-G 6834 | 1x1x1 | One face |
| S-G 6835 | 1x1x1 | One face |
| S-G 6838 | 1x1x1 | One face |
| S-G 6840 | 1x1x1 | One face |

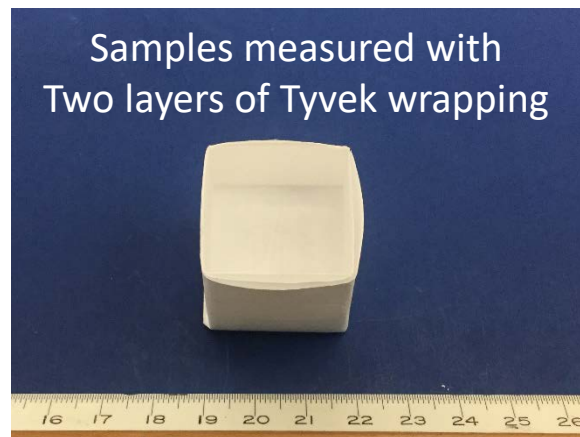
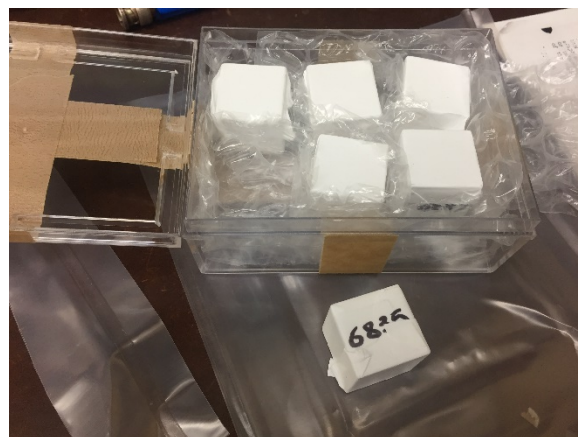
All samples received on Feb 5th, 2018 (Mon.)

Experiments

- Properties measured at room temperature : LO, ER, and F/T



Package & Wrappings



Teflon wrapping was replaced by two layers of Tyvek with polished end coupling



Summary: F/T Ratio

| ID | 200 ns ER (%) | 200 ns LO (p.e./MeV) | 3000 ns LO (p.e./MeV) | LO(200) / LO(3000) (Caltech Data) | LO(100) / LO(1000) (S-G Data) | Conversion Factor (%) |
|----------------|---------------|----------------------|-----------------------|-----------------------------------|-------------------------------|-----------------------|
| S-G 6827 | 26.9 | 266 | 273 | 97.4 | 87.6 | 89.9 |
| S-G 6828 | 25.3 | 279 | 283 | 98.8 | 87.9 | 89.0 |
| S-G 6834 | 25.8 | 315 | 326 | 96.6 | 86.4 | 89.4 |
| S-G 6835 | 22.7 | 379 | 389 | 97.5 | 88.3 | 90.6 |
| S-G 6838 | 24.5 | 316 | 324 | 97.5 | 87.5 | 89.7 |
| S-G 6840 | 24.4 | 298 | 301 | 98.5 | 88.5 | 89.8 |
| Average | 24.9 | 309 | 316 | 97.7 | 87.7 | 89.8 |
| RMS/Ave | 5.2% | 11.7% | 12.0% | 0.8% | 0.8% | 0.5 |

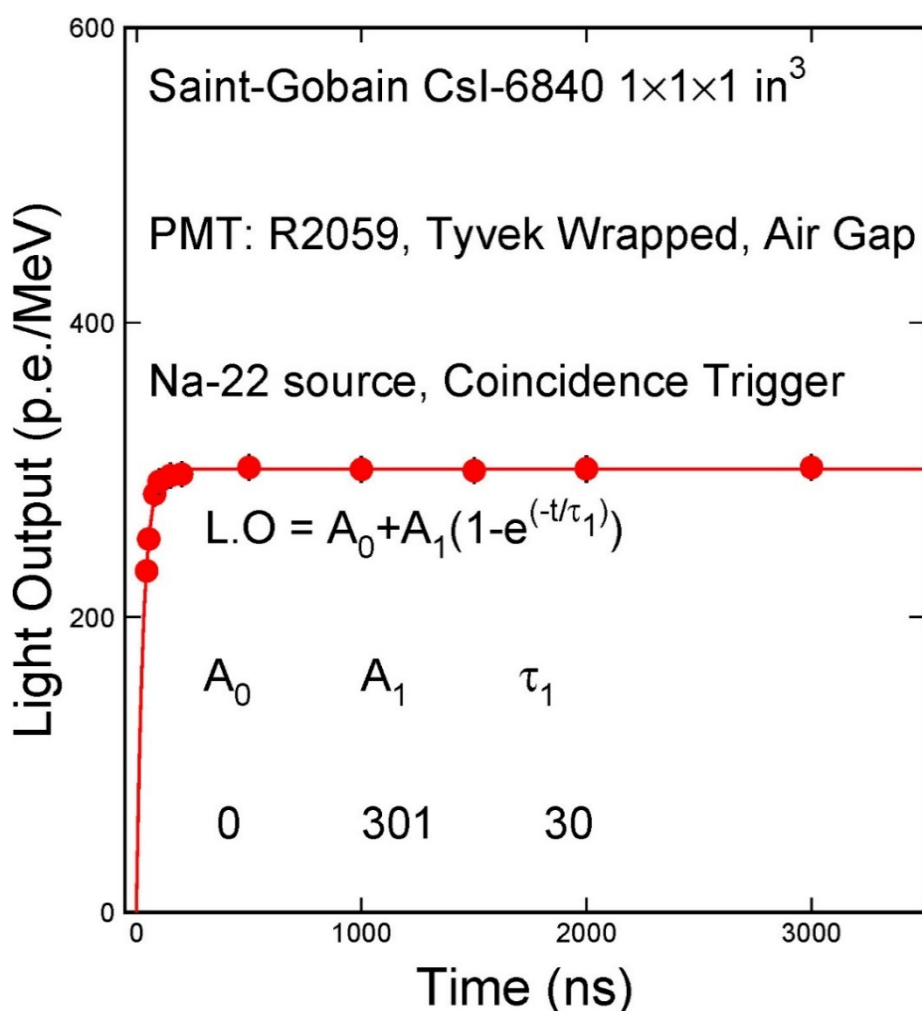
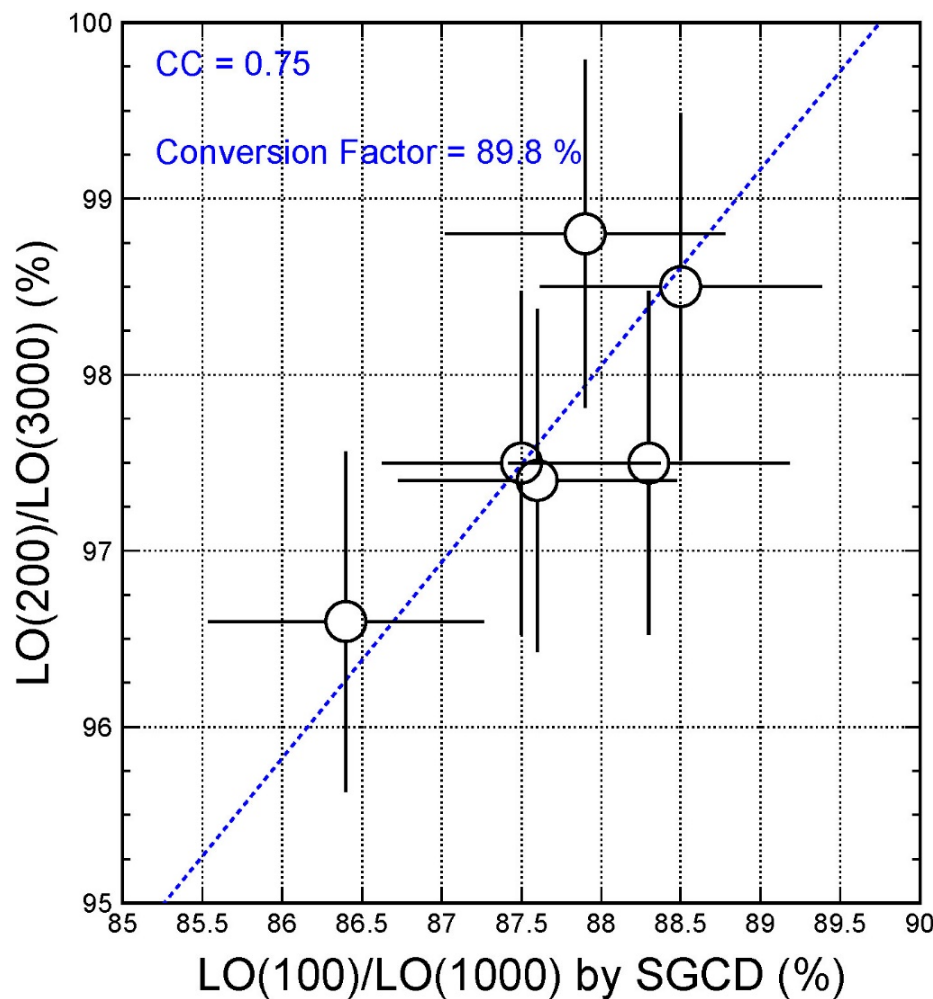
Conversion factor: $(89.8 \pm 0.5)\%$ from the Mu2e data to the S-G data



Correlation & Typical Decay Kinetics

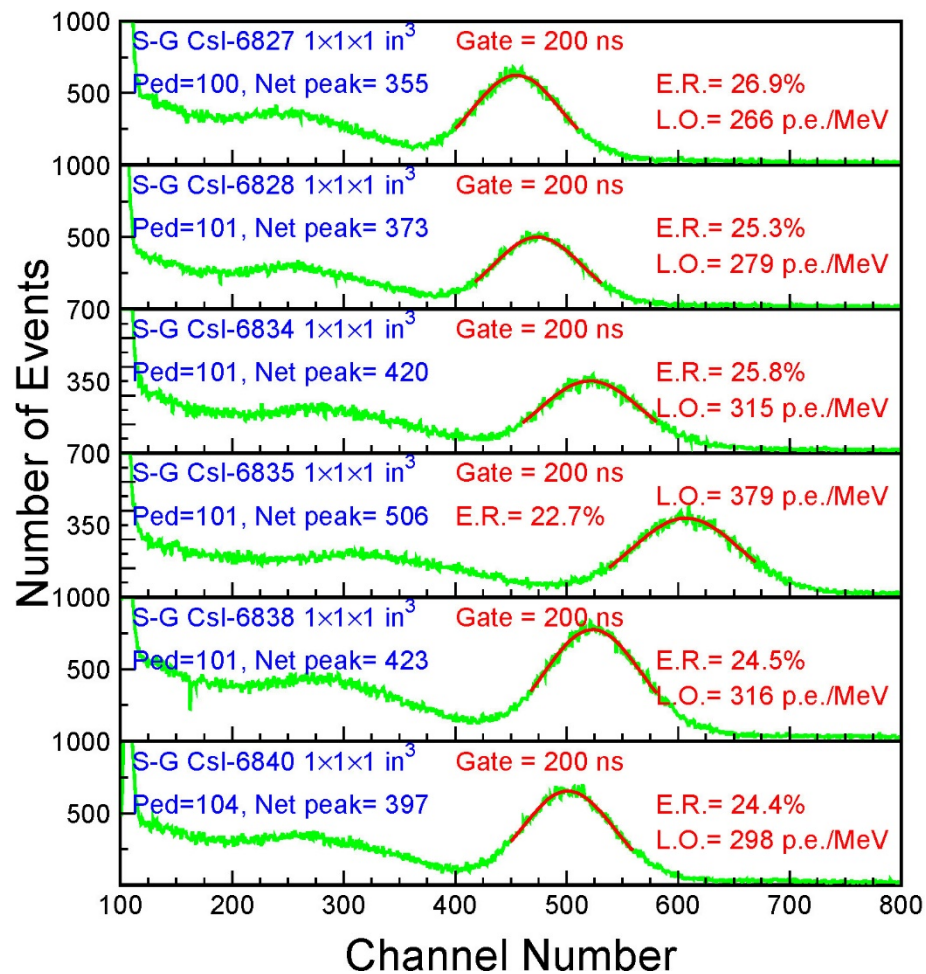
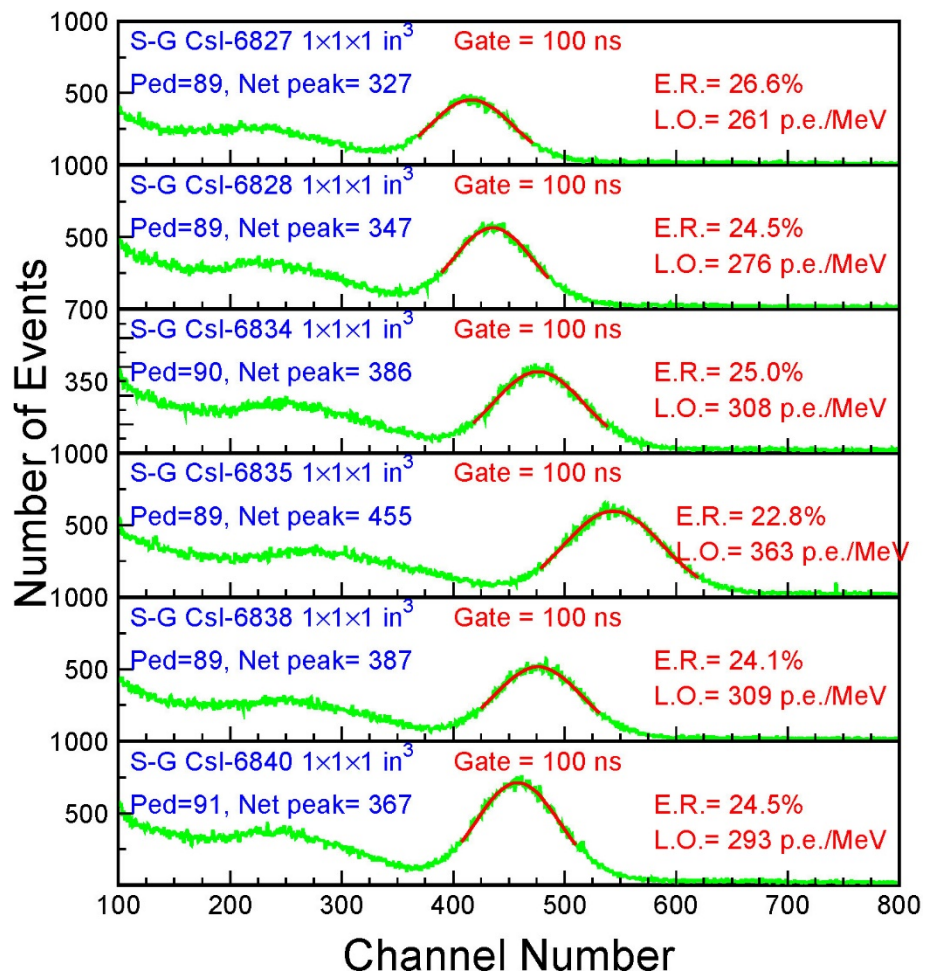


Excellent correlation between the Mu2e and Saint-Gobain data
Main decay time: 30 ns. Almost no slow component





PHS & LO: 100 ns and 200 ns





PHS & LO: 1,000 ns and 3,000 ns

