

Weekly Meeting

July 25 2018

DQM

- Have list of rqs and rrqs that are needed for type 3 decider decisions (or at least to create diagnostic plots)
 - HV
 - * paampres ... pdampres
 - * pxdelWK, pydelWK
 - * paINT ... pdINT
 - iZIP:
 - * pxpartINT, pypartINT
 - * pa1INT ... pd2INT
 - * qi1OF ... qo2OF
 - * pzsumpartINT
 - * qsum1OF, qsum2OF
 - * qzpartOF
 - * ygsumINT
 - * qrpart1OF, qrpart2OF
 - * prpartINT, prpart1INT, prpart2INT

DQM

- Next steps:
 - Go through cdmsbats, determine which functions/algorithms/etc are needed to produce those rqs/rrqs.
 - Do some timing measurements to determine how long it takes to produce those rqs/rrqs
 - Include noisePSD in this
- Ben Smith has created some fake data that mimics SNOLAB data (trace length, num detectors, num channels, etc)
- One thing to note is that there is no down conversion in these traces – may have an effect on timing

Light Sources

PDL 800-D

Picosecond Pulsed Diode Laser Driver with CW Capability

- Pulsed and CW operation
- Easily selectable repetition rates from 31.25 kHz to 80 MHz
- Externally triggerable from single shot up to 80 MHz / sync output
- Laser pulse energy adjustable via driver unit
- Laser heads from 266 to 1990 nm, LED heads from 255 to 600 nm
- External trigger / sync output



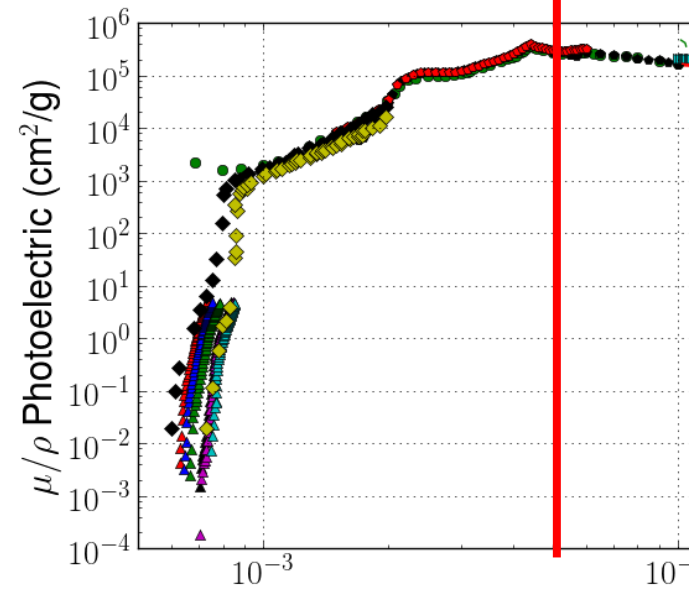
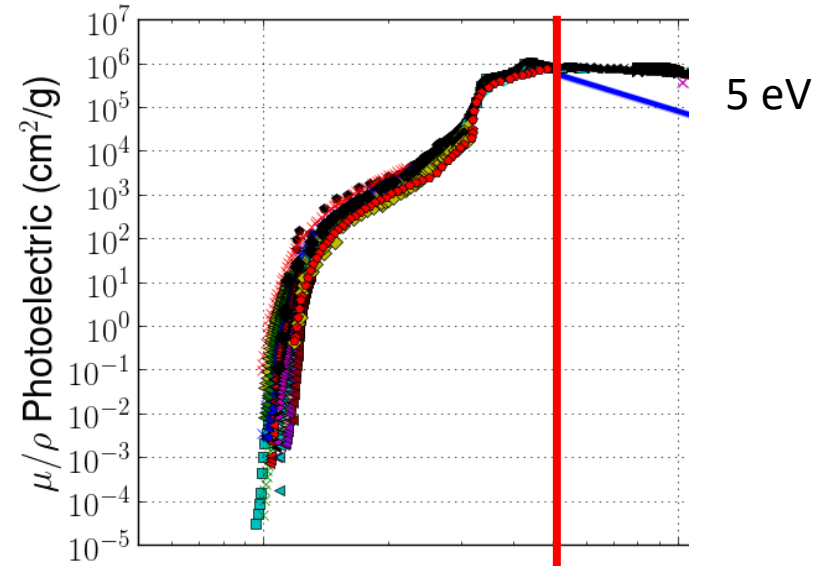
4.66 eV

LDH-FA Series

Amplified Picosecond Pulsed Laser Diode Heads

- Available wavelengths: 266, 355, 515, 531, 560, 766, 1064, and 1532 nm
- Pulse width down to 70 ps (FWHM)
- Average output power between 1 mW and 450 mW (depending on wavelength)
- Repetition rates up to 80 MHz
- Collimated beam or PM fiber output with FC/APC fiber connector

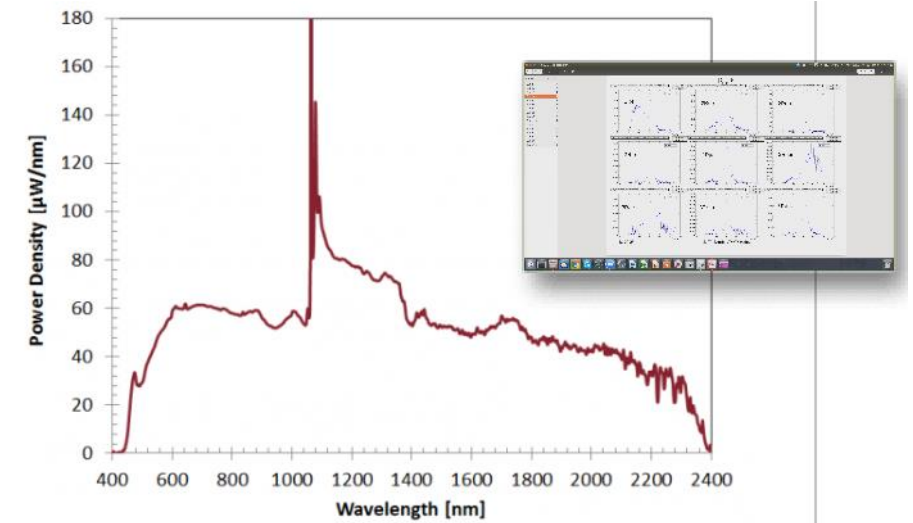
Light Sources



Light Sources

2.7 eV

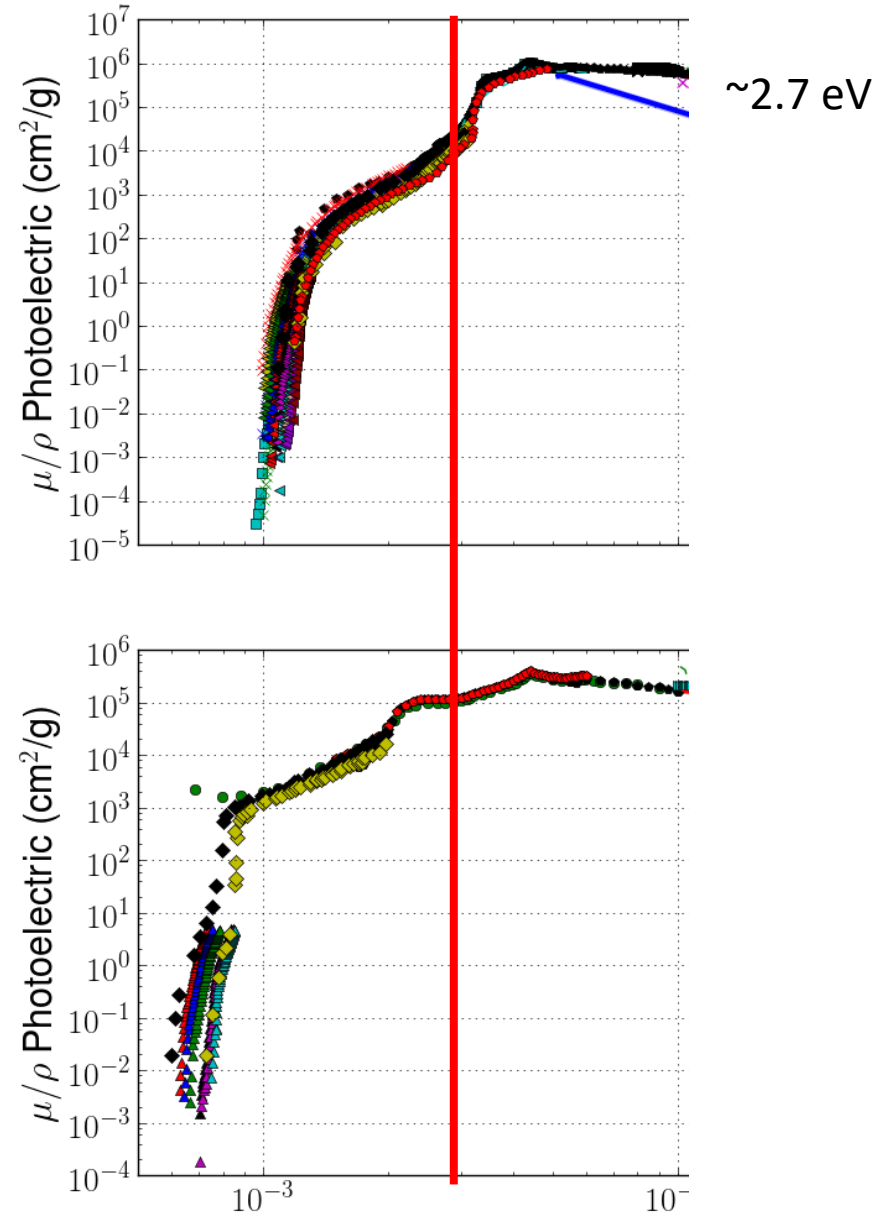
Optical Spectral Range	450-2400 nm
Total output power	> 110 mW
Total VIS power (450-850 nm)	> 25 mW
Output power stability (1 hour)	<± 1.0 % (± 0.5 % on request)
Spectral stability 600-1040 nm / 1100-1500 nm	< 0.12 dB per hour / <0.14 dB per hour
Typical warm-up time (power stability)	~30 min (room temperature)
Repetition rate	Variable 1 Hz to minimum 20 kHz
Output pulse width	< 2 ns
Pulse-pulse jitter (Std. Dev.)	< 2 μs (rep rate dependent)
Output fiber	Single mode
Output termination	Collimator, FC/PC or FC/APC connector
Beam diameter (collimated)	~1mm at 530 nm ~2mm at 1100 nm ~3mm at 2000 nm



l with low jitter up to 20 kHz. The trigger signal can be put that galvanically isolated.



Light Sources



Light Sources

- What we also need to think about – fiber optic cable. Can we get cables that can transfer these wavelengths to the detector?

Photoelectric Cross Section Measurement

- Noah, Chris and I all agree that the 'staircase' is the best way to go.
- Matt Pyle thinks that this should be easy enough to fabricate
- Can start using the laser they have at 1.91 eV

- Si should be straight forward. Thickness side can be ~ 100 μm , thinness side can be ~ 0.65 μm (wavelength of laser)
- Ge is going to be much more difficult, as cross section is much higher. At 1.5 μm , only 0.0004% of light will pass through the Ge.

Other news

- I leave next week!
- Plan to do before leaving:
 - Get a lot of these DQM done (or to a good enough place for now)
 - Upload my version of sensitivity code to repository. It will need fixing, but I want it there so people can at least see/use it.