**PLQY Standard Operating Procedure**

Hardware:

(This should all be configured automatically, but if any connections fail, check these)

* Laser Diode Control connected to reference out “SINE OUT” from Lock in amplifier
* Lock-in amplifier is connected to PLQY cable from photodetector under signal input
* Turn on TEC control on Laser Diode Control
* Turn on Laser Diode Control
* Gain set to 40 on photodetector

Control code:

#Pull up terminal --> start button, cmd prompt

* Set terminal to interactive python mode
  + Type “iPython”
* Import control code from PLQY directory
  + Type “from PLQY import control”
* Initialize the PLQY object
  + Type “plqy = control.PLQY(810)”
* CD into a directory
  + Type “cd \path\to\directory”
  + Recommend saving to local Data folder instead of Synology drive for redundancy
  + Make a new directory for every individual sample’s iJV curve for ease of data processing
  + #example: “cd D:\HV\20231019\_Connor\_iJV\20231020\_iJV\_XTAL\SONIC\_9999”

To take PLQY:

* Insert sample into white sample holder of appropriate size, insert into PLQY setup.
* Use take\_PLQY function
  + Type “plqy.take\_PLQY(‘sample\_name”, max\_current = 780, n\_avg = 10, time\_constant = 0.03, frequency\_setpt = 993.0)”
  + Max\_current = 740 roughly equals 1 sun illumination
  + This will take PLQY at ~1 sun, or any intensity you wish, based on max\_current value

To take implied JV curve (intensity dependent PLQY):

* Use take\_iJV function
  + Type “plqy.take\_iJV(‘sample\_name’)”
  + This will take PLQY from ~1 sun down to ~1e3 suns on default settings)
  + Optional arguments include:
  + plqy.take\_iJV(Sample\_name="sample", start\_current=780, end\_current=300, step=-20):
  + Adjust start\_current, end\_current, and step size as necessary

Export data as needed- e.g. copy paste into Synology Drive.

Turn of Laser and TEC when finished measuring samples.