

# LAr R&D Progress Updates

Yichen

6/17/25



# Lab Safety and Space Management

## ► **Safety Month in June**

- A series of safety events hosted by the lab
- [https://www.bnl.gov/newsroom/results.php?kw=safety\](https://www.bnl.gov/newsroom/results.php?kw=safety)

## ► **Stock room closure**

- Department admin decided to shutdown the stock room for Bldg 510
  - Due to financial reasons
  - No items will be provided
  - Receiving shipping items will be stored in cages, no personal monitoring

## ► **Nal Detector Moving**

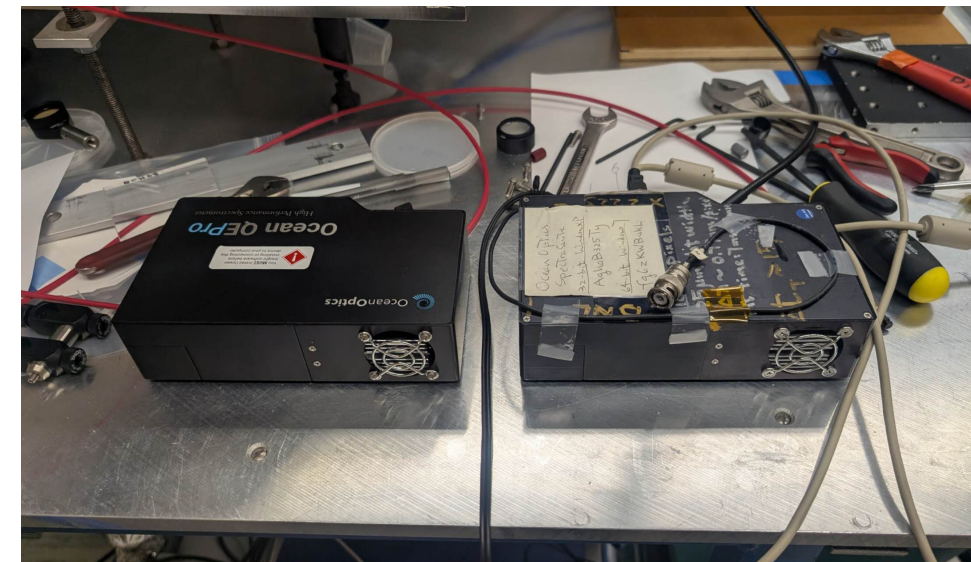
- The smear test results showed it is clean
- Clear for shipping to JLab/UVA

# PTP coating measurement

## ► Comparison Spectral Measurement

- Now we have two spectrometers in hand:
  - Loaner from Thomas: QE65000
  - Our own: QEPro XR500
- Spectrum measurement conducted on all samples with both spectrometers in transmission mode only
  - Measurement in two batch
    - First: Fermilab sample and #42, #50 from SBU
    - Second: Yimin's sample: Quartz, Sapphire, B33

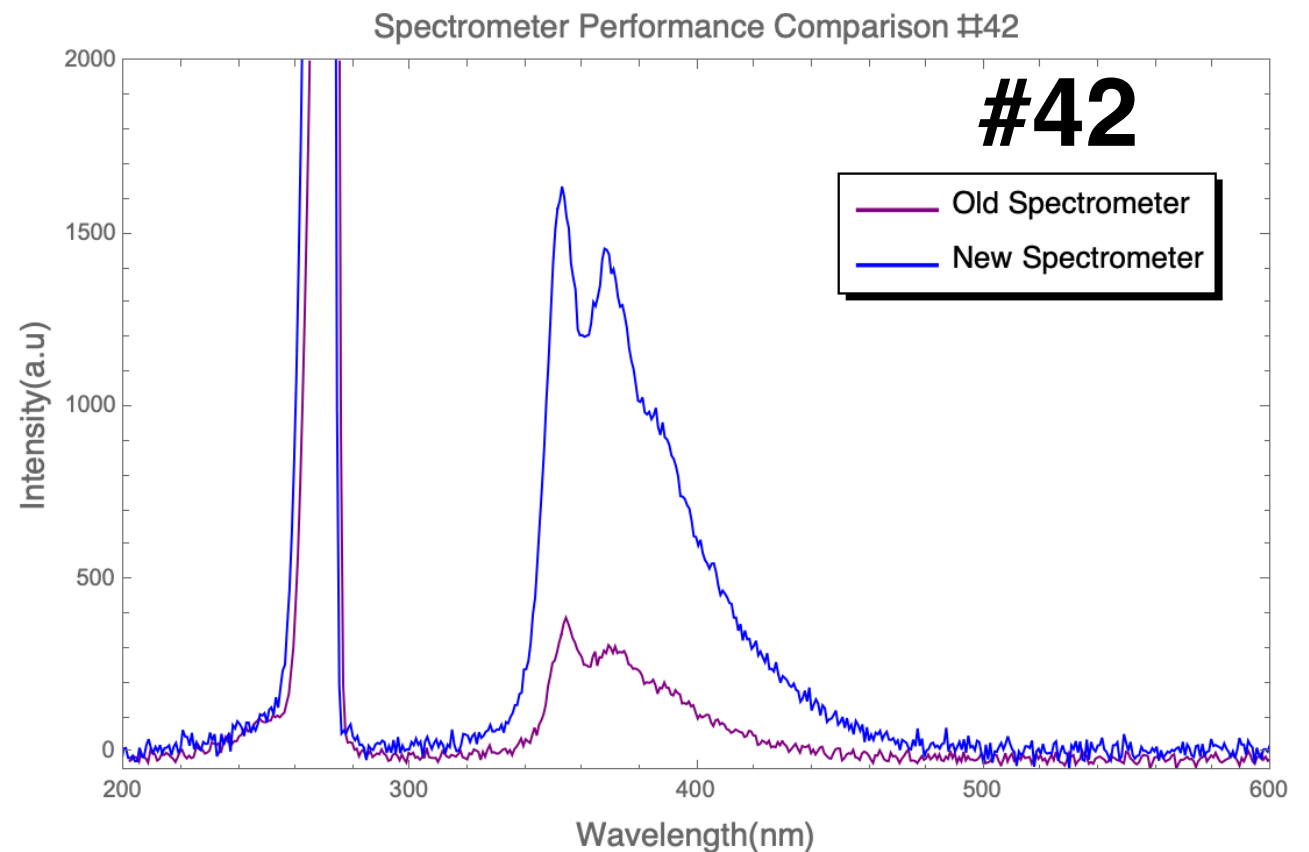
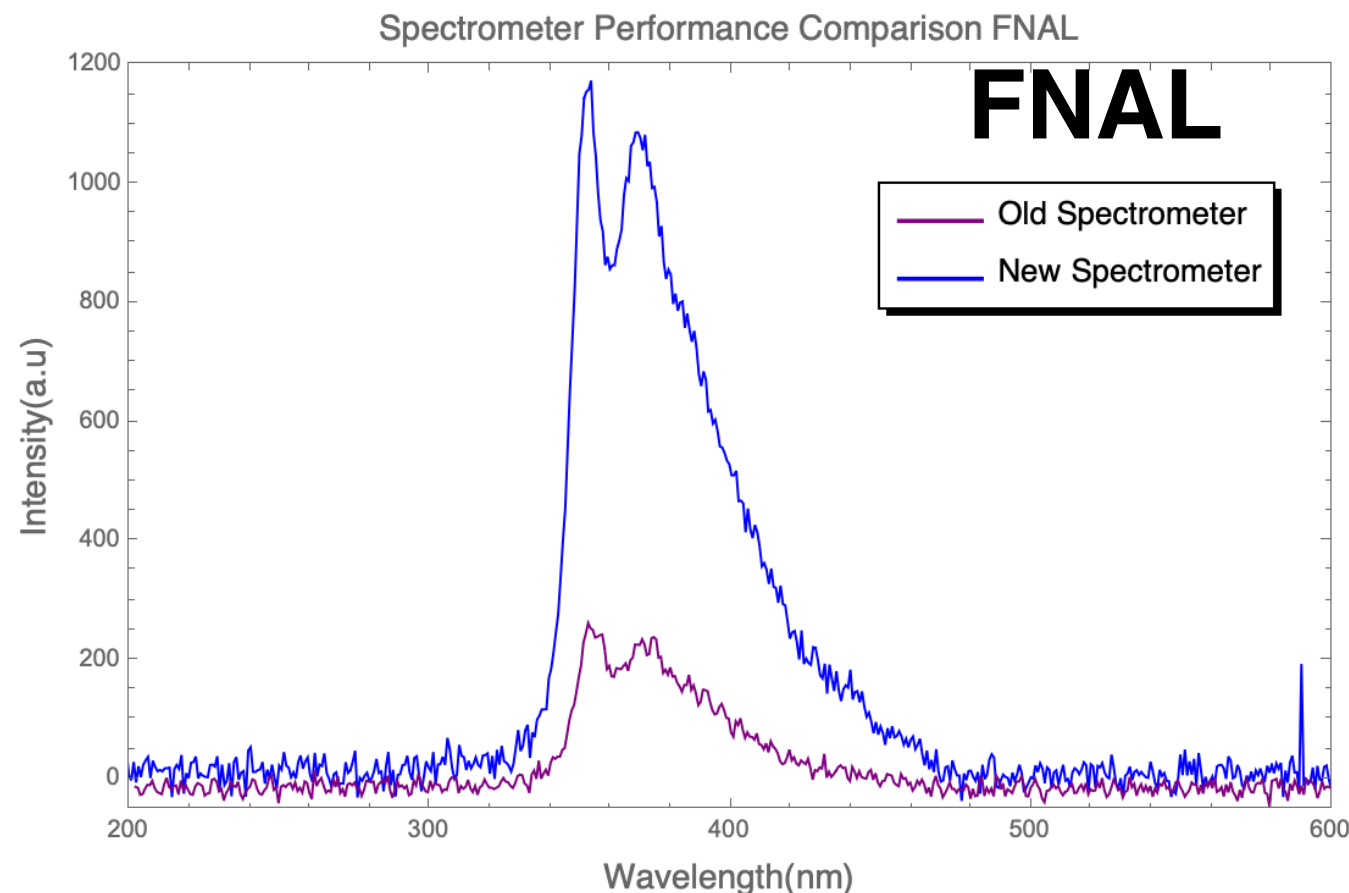
Sample Name	Note
<b>Quartz</b>	from LaserFiberOptics
<b>Sapphire</b>	from LaserFiberOptics
<b>B33</b>	from LaserFiberOptics
<b>Fnal</b>	from Fermilab, used in VD
<b>#42</b>	From SBU
<b>#50</b>	From SBU



# PTP coating measurement

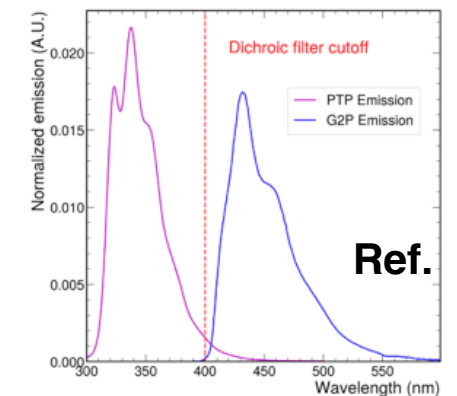
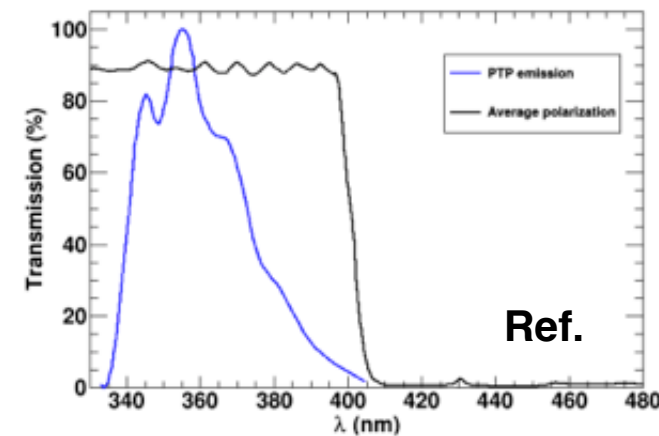
## ► Spectrometer comparison measurement

- Emission spectral taken with 266nm excitation
- The optical setup is fixed at the sample and light collection side
- Only change at the spectrometer side by re-plugging the fiber
- Higher signal amplitude and better resolution
  - Better observation on the fine peak structure



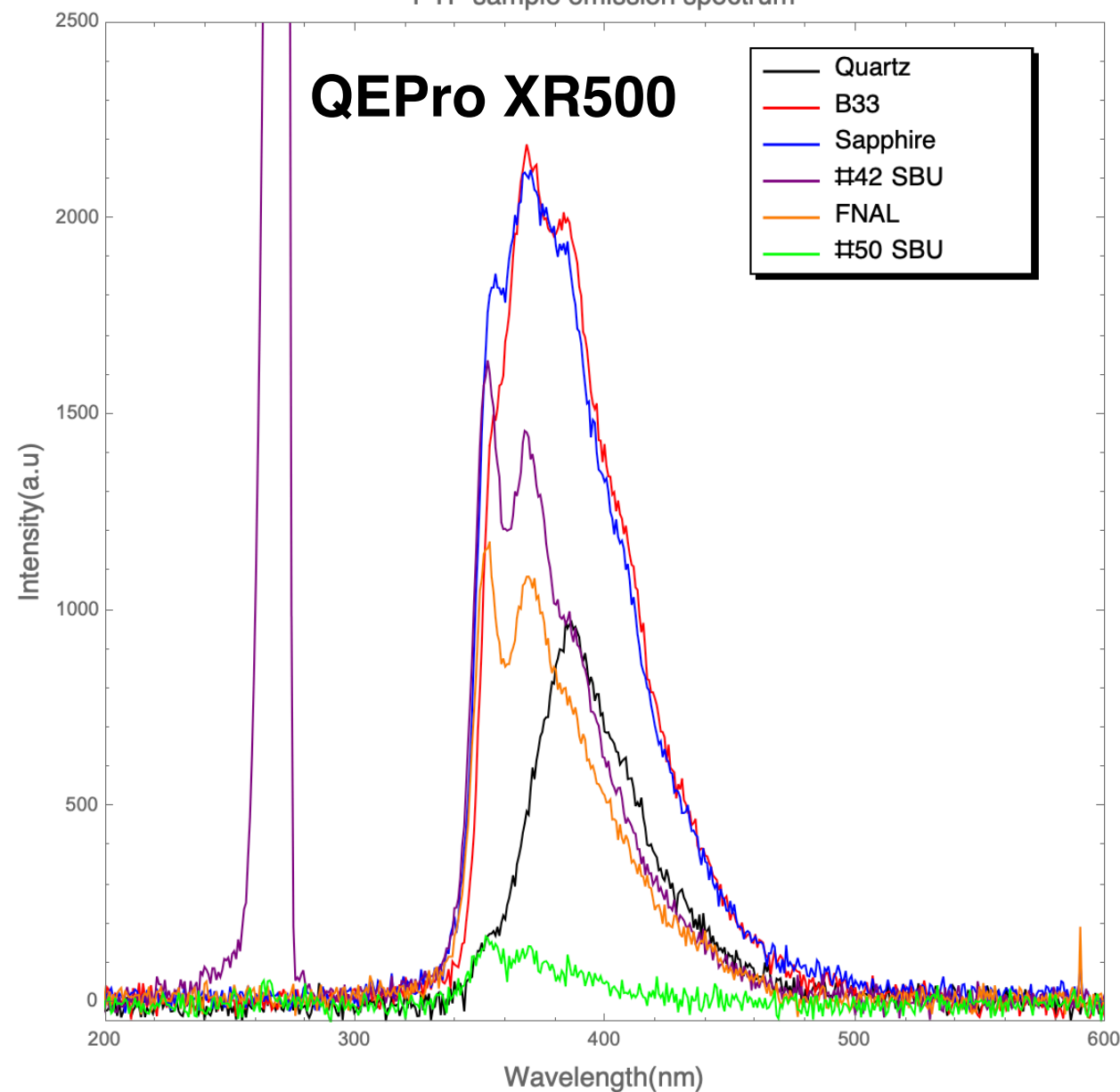
# PTP coating measurement

- **Results for all samples**
  - Only measured in transmission mode now

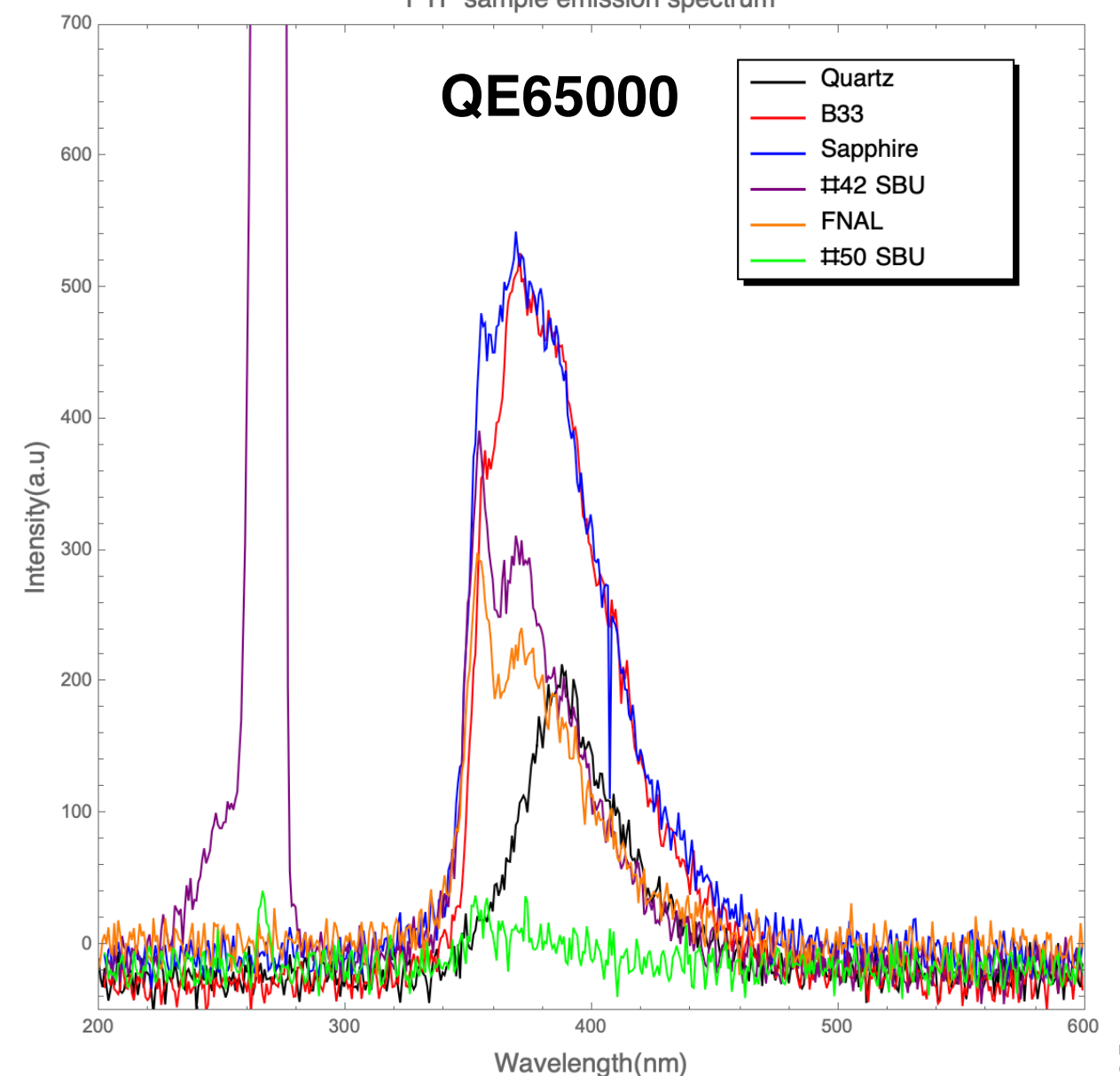


(b)

PTP sample emission spectrum



PTP sample emission spectrum

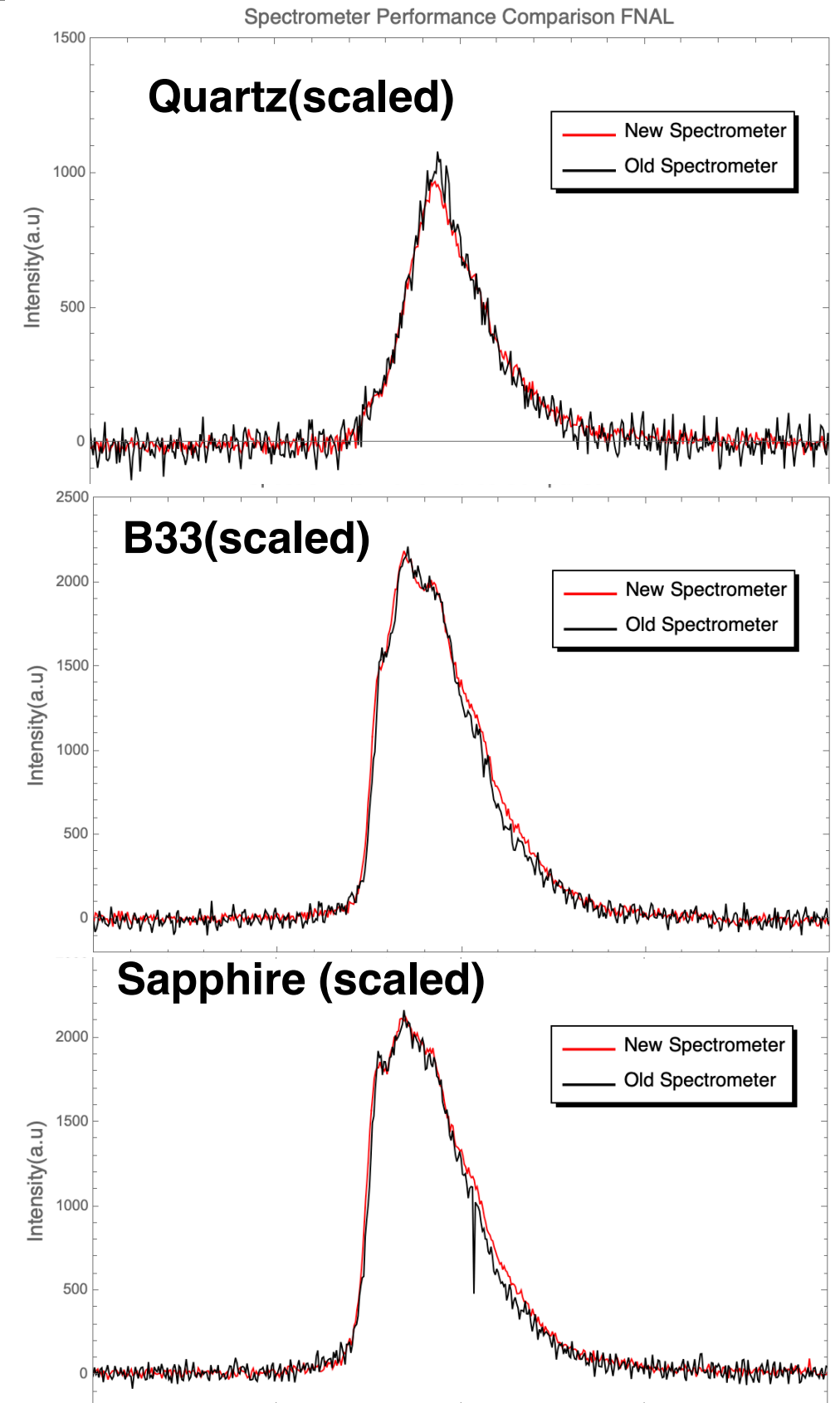
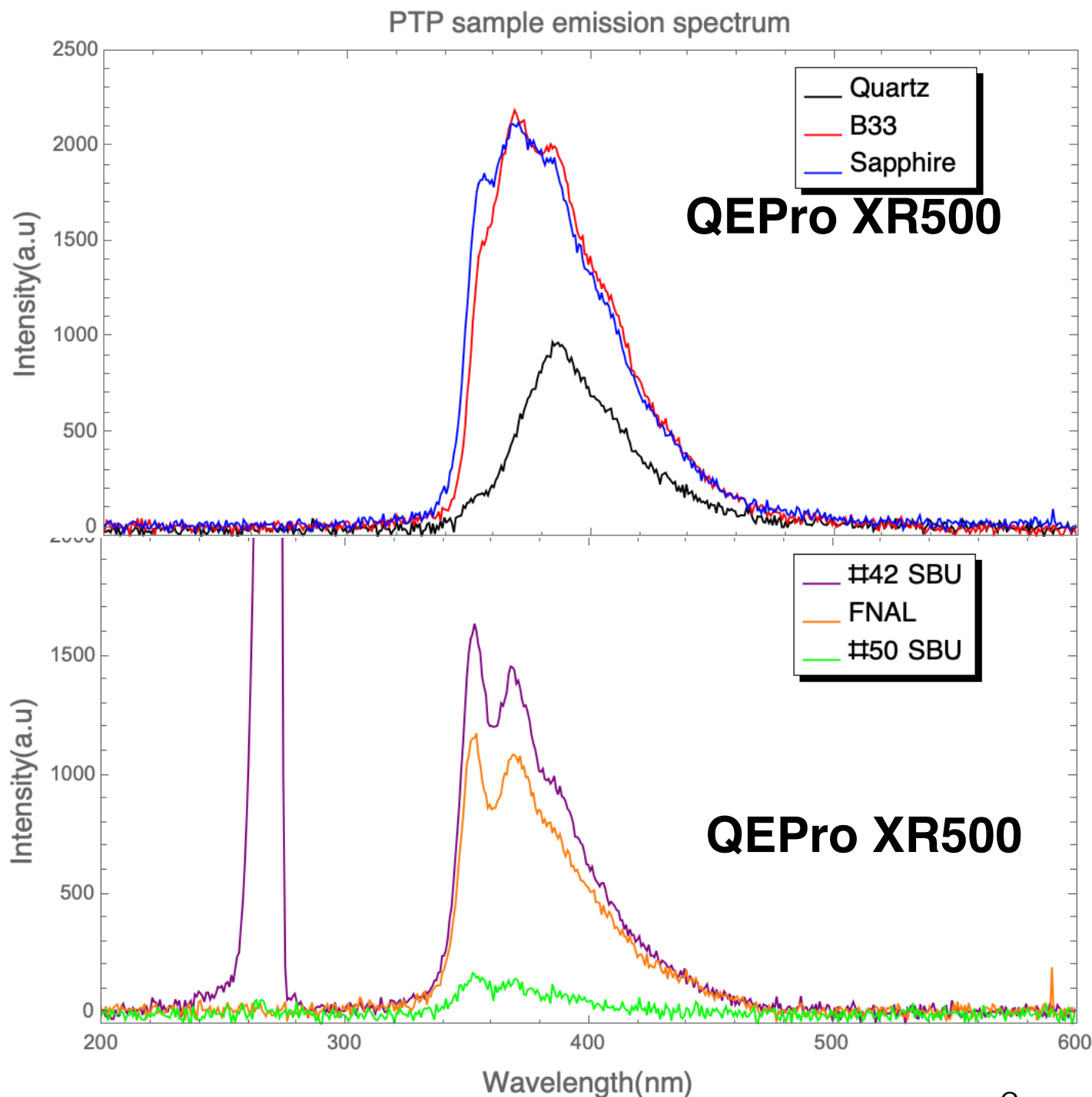




# PTP coating measurement

## ► Results for all samples

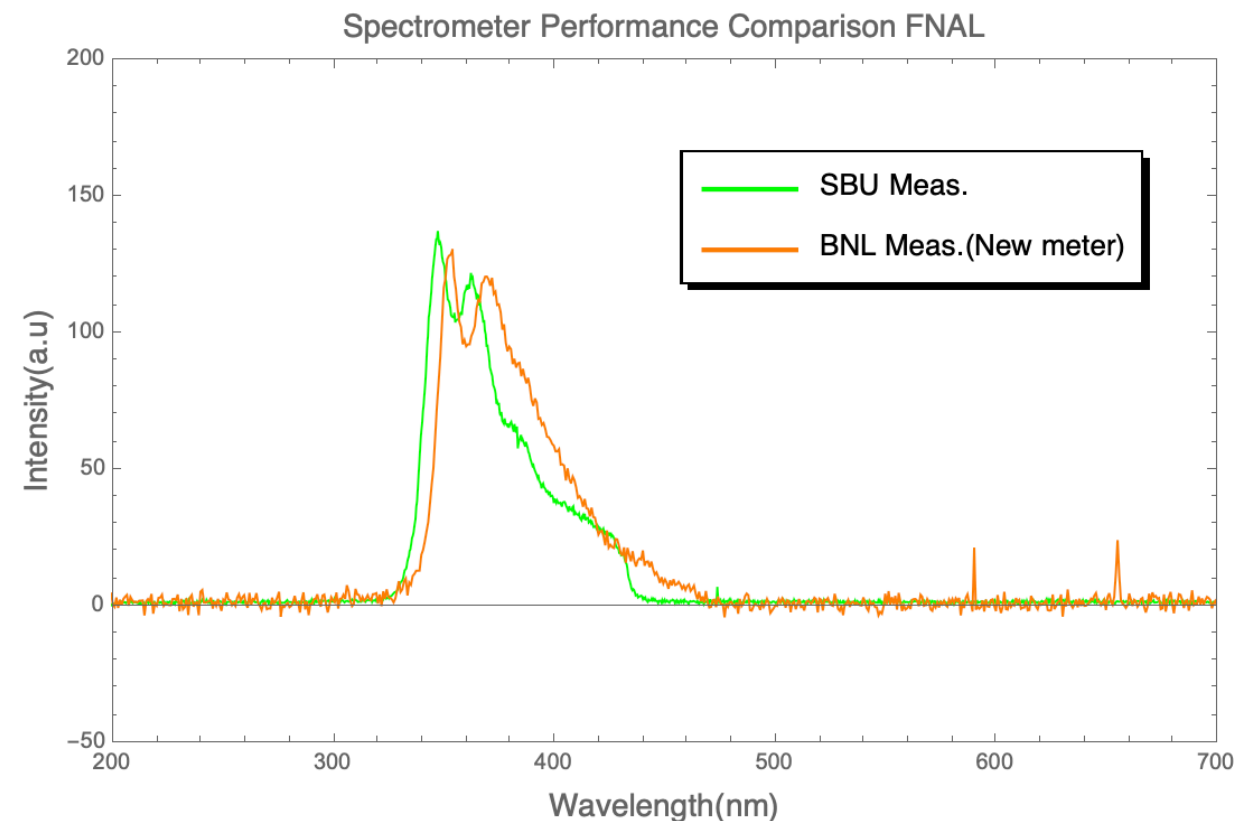
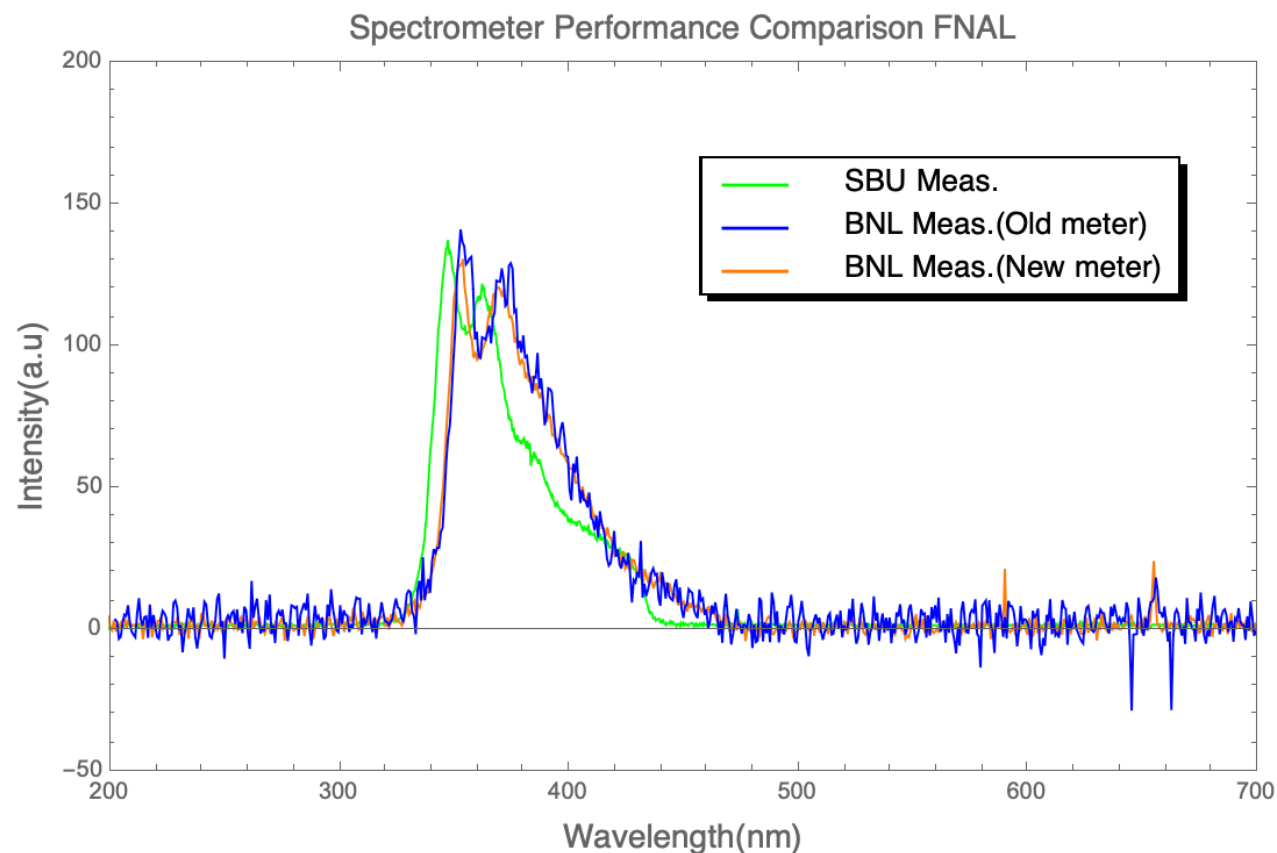
- Each of our sample has slightly different structure
- The shapes between spectrometers agree with each other
- New spectrometer has better resolution



# PTP coating measurement

## ► Comparison to SBU measurement

- Spectrum measurement comparison on the same sample from Fermilab
- Measurement conducted with both old and new spectrometer
- Slight different from SBU measurement



# Data Collection

## ▸ Coating sample progress

- All data has been put on my **OneDrive**: Spectrometer\_Data
- The data filename is self-explained
- [number]\_
  - Wavelength from monochromator
- Spectro\_
  - Spectro1: USB4F06248 spectrometer, from Thomas
  - Spectro2: SR600698 new spectrometer, from Sean
  - Spectro3: High sensitivity QE65000, from Thomas
  - Spectro4: High sensitivity QEPro XR500, our own
- Coll\_
  - Collimator size, we have a 1/8 and 1/4" one, mainly use 1/8 UV collimator now
- [sample]\_
  - Sample specification
- -[number]s\_
  - Total integration time in seconds
- \_r[number]\_.....
  - Round ID and index



# Plan for measuring new samples

- I will be on vacation 6/29-7/16
- Jay and Vyara will conduct measurement with new samples from Yimin expected by the end of June
- SOP draft in progress
- We are going to meet tomorrow to go through the measurement
- Will conduct repeat measurement on the diamond samples