

LAr R&D Progress Updates

Yichen

2/18/26



Lab Safety and Space Management

▶ **Inclement weather expected this weekend**

- Lab is closed for Monday and Tuesday
- Please be careful when returning onsite for the slippery conditions

▶ **Building Power Outage this weekend on 02/21**

- The work finished around 1pm on Saturday

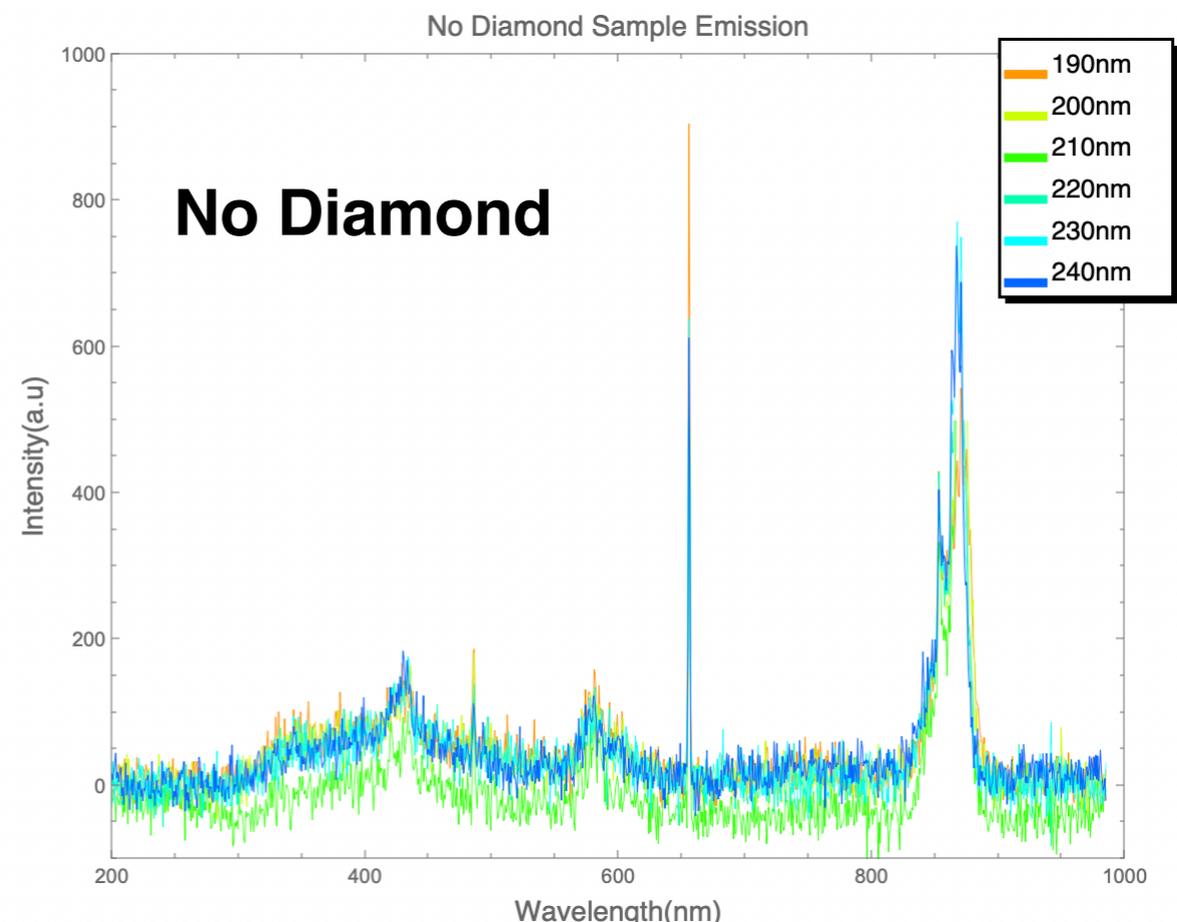
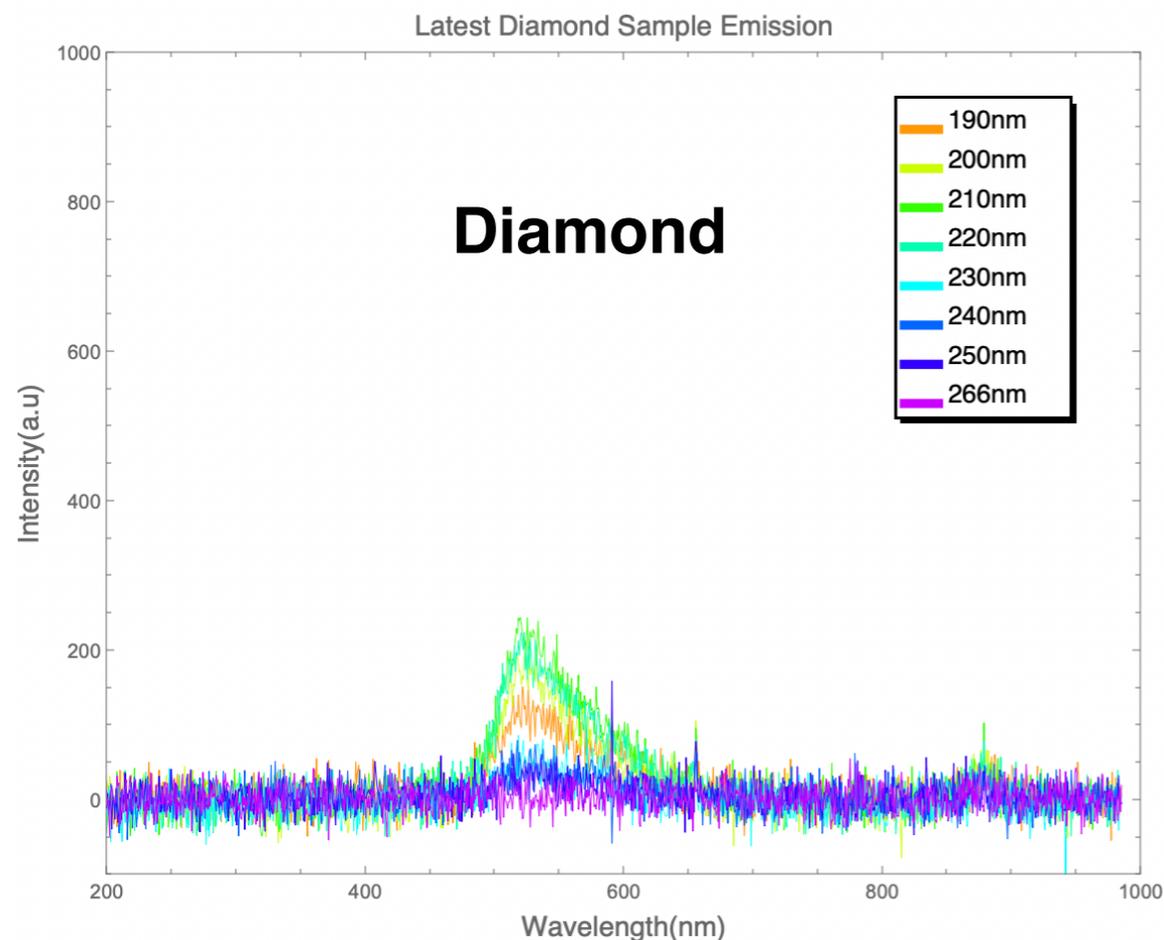
▶ **ESR changes**

- I took the PI roll for the ESR# PO-099-2023, mainly the RM 2-224 lab

Diamond sample measurement

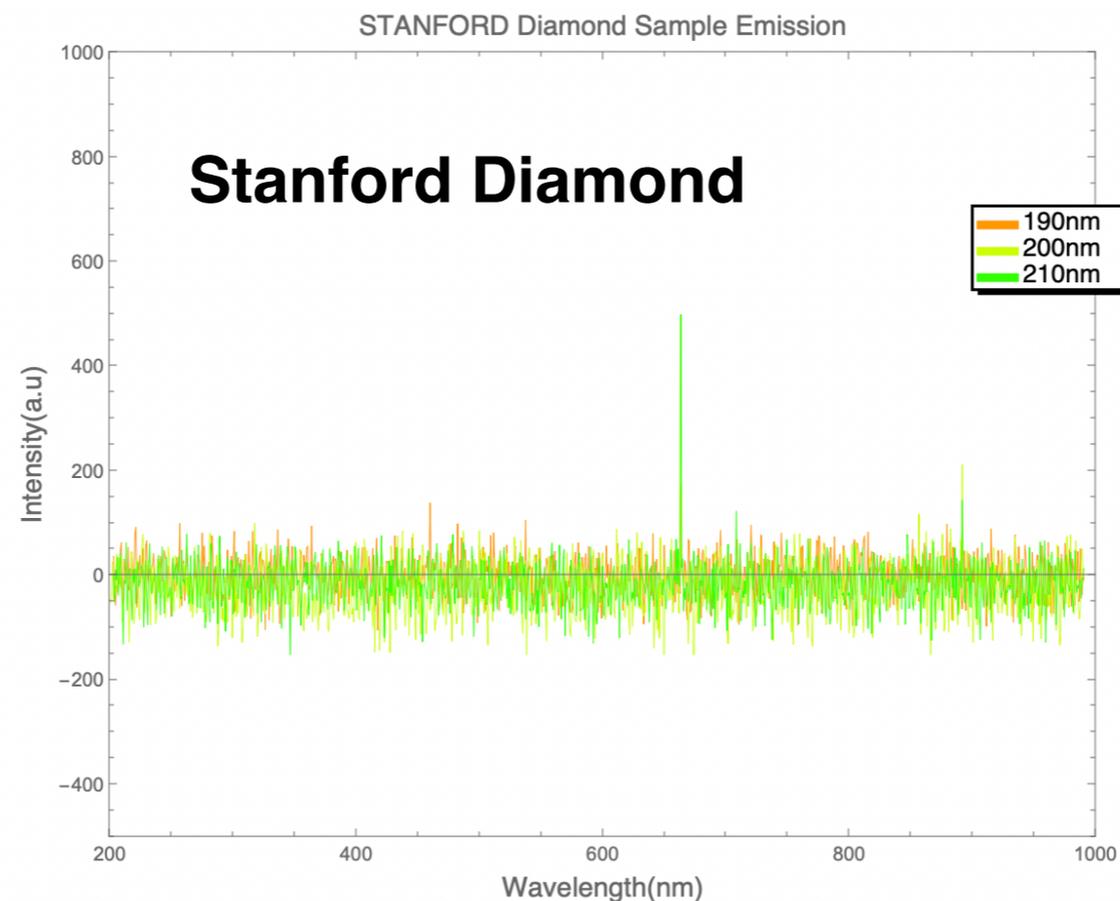
► New Diamond Sample emission spectrum

- To exclude in the impact of substrate
- A substrate with no diamond coating was measured with the same light source and configurations
 - There are emissions with multiple peak, most significant is IR region
 - No overlap with the diamond emission
 - We can conclude the diamond emission was observed on these samples
- Our high sensitivity spectrometer was malfunctioning, no measurement with the 250 nm 266 nm wavelength
- The spectrometer will be return to the vendor for repair under warranty



Stanford Diamond sample measurement

- Received a batch of new diamond samples from Stanford
- Given our spectrometer is not working, I borrow one from Thomas
 - Similar spectrometer we used before
 - Low noise with cooling CCD
 - Only 1/5 sensitivity of ours, this sensitivity was validated by our and Thomas' measurement
- Spectrum was measured with 5x integration time, ~2.5 hrs to compensate the low sensitivity
- Only took data with 190nm, 200nm, 210nm due to limited available time of the spectrometer
- No emission was observed in this batch



LXe collection

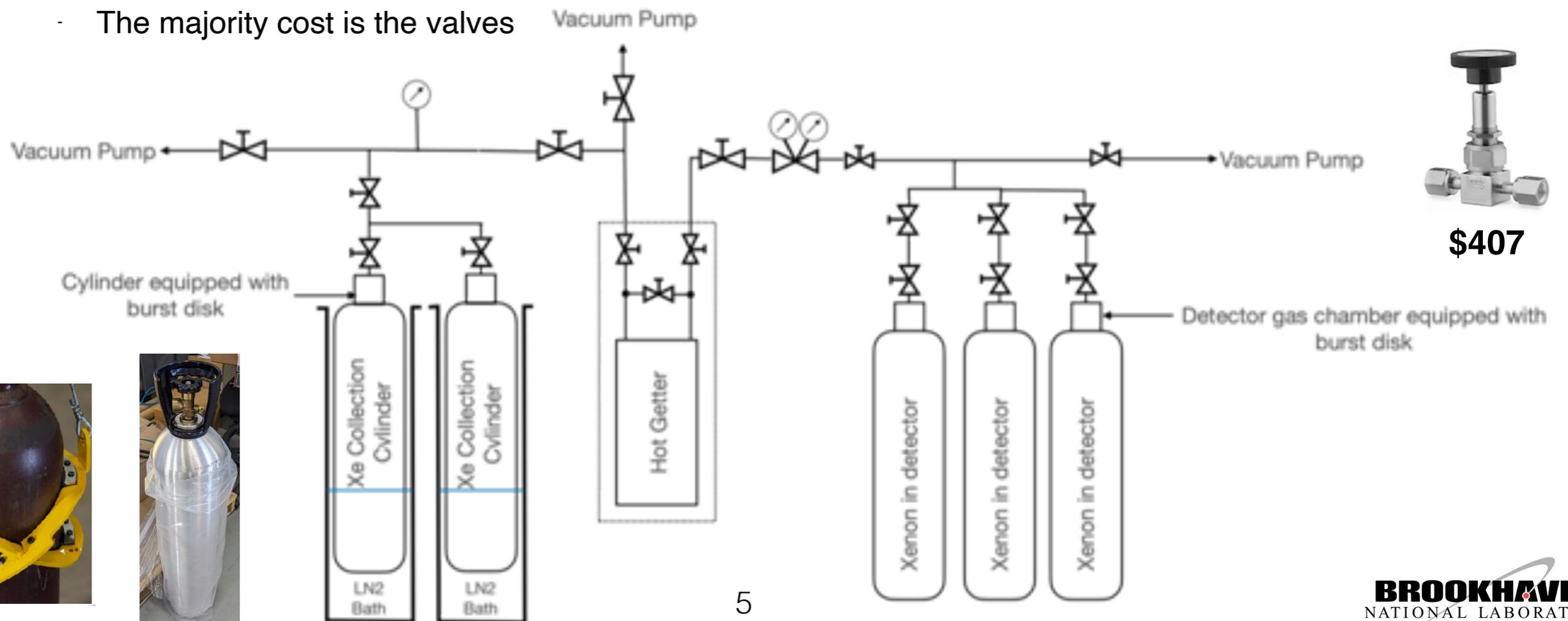
- ▶ There was an inquiry for Xe from PIONEER experiment
 - Our previous effort was paused due to funding limit
 - The storage dewars are received and approved by lab safety
 - Lifting hardware received
 - The only major item left is the construction of the extraction system
 - The safety review process can be covered with a one time work permit
 - It is a good opportunity to finish the work
 - Xin is going to inquire for funding for the system
 - The majority cost is the valves



\$318



\$407



LXe extraction discussion

- Given the valves are the dominating cost
- What is the simplest design?
- Can we go with Swagelok fitting from VCR to save some cost?
- Any other additional significant cost?
- Additional functionality of the system? Probably as the part of Xenon recycling system for the future test facility
- Operating procedures for the transfer