

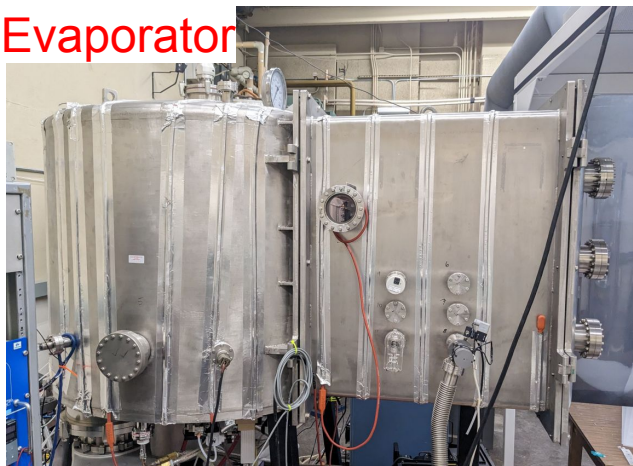
pfRICH Mirror Evaporation Recap and Upgrade Plan

pfRICH Mirror Coating Team

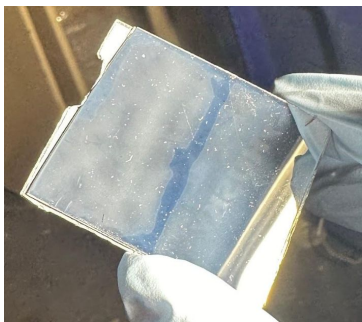
March 18, 2024

Run down of the milestones

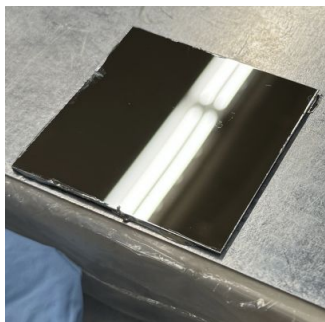
Evaporator



2024/1



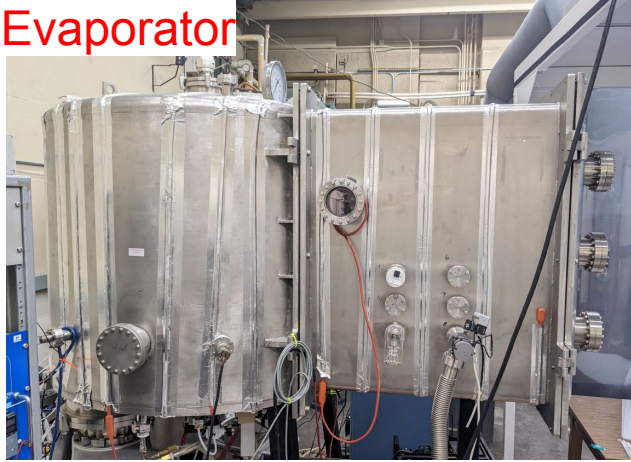
2024/3



- **2023/11:** First coating,
- **2023/12:** First coating reflectivity ~70%
- **2024/2:** First report completed
- **2024/3: Reflectivity reached ~90%**
 - mystery about cloudy texture after coating resolved

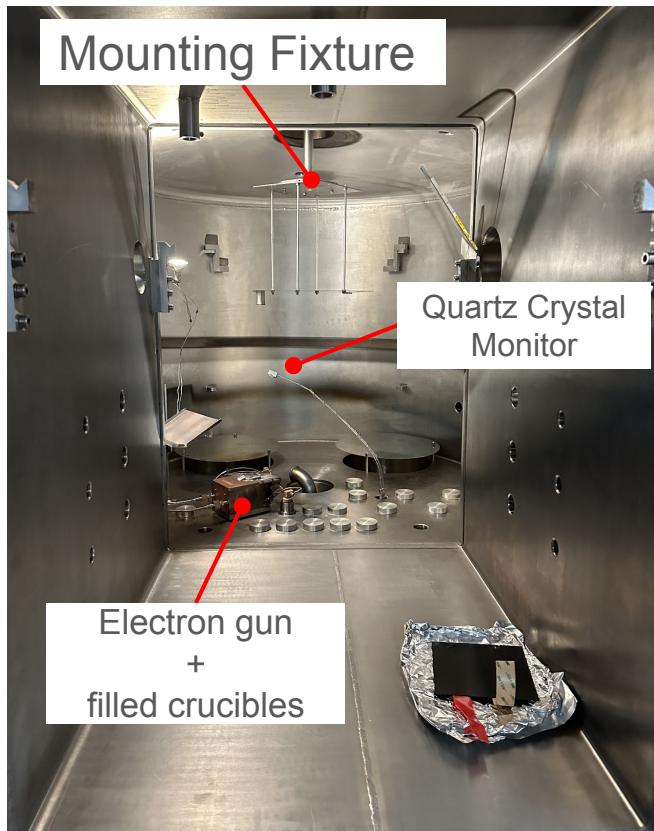
PED Obligations/Objectives

Evaporator



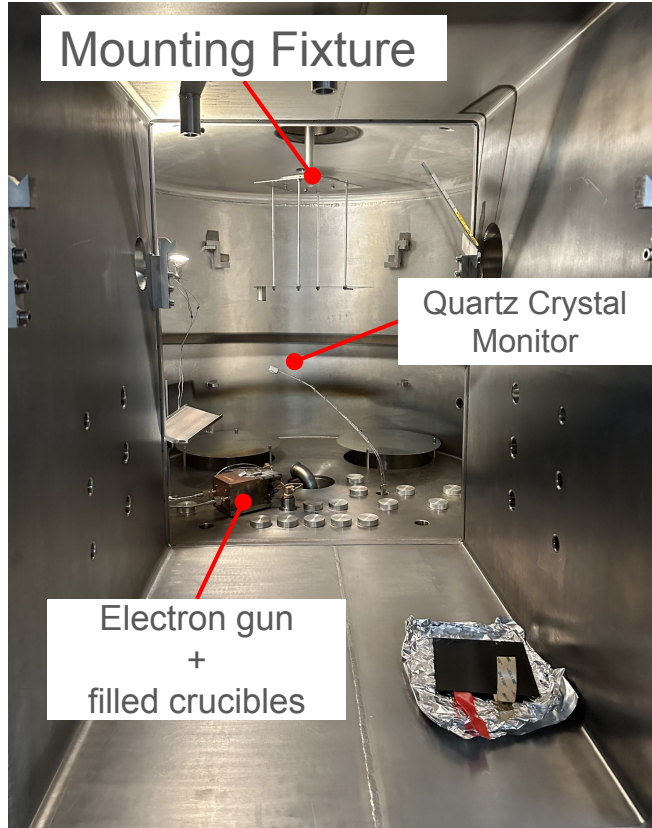
1. **Jan 2024:** demonstrate that SBU evaporator is capable of consistently producing mirror samples with reflectivity above >90% at 300-600 nm. SBU and BNL groups will complete the characterization of coated samples and determine if further improvement is required. Quick feedback on the result will be given to the pfRICH Detector Subsystem Collaboration and the EIC project. **[Done]**
2. **April 2024:** mirror coat the substrate test articles (four pieces + control sample) provided by the Jefferson Lab, and characterize their performance at BNL. **[Awaiting the substrates]**
3. **June 2024:** provide a report regarding the outcome of the mirroring process and the results of the complete characterization of all coated samples. The report will also state potential improvements related to the mirroring process and configuration for future use. **[Partial Completion]**

Next Step



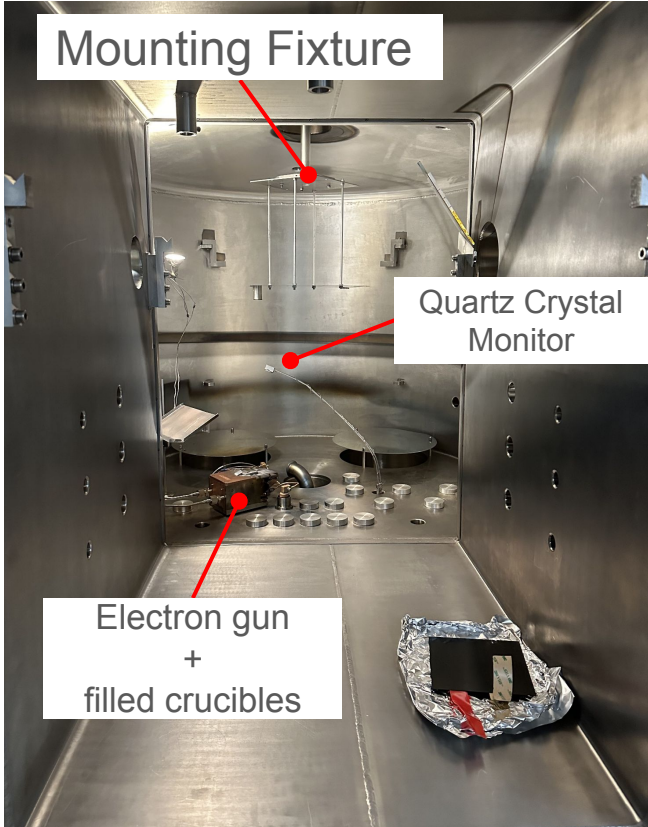
- **Entering an 8 week upgrade period**
- **Better vacuum**
 - Repairing cryopump, for reach 10^{-8} torr (currently, 10^{-6} Torr)
 - For an improved Al vapour granularity
- **Ionized Gun**
- **A better mounting scheme for hosting larger substrates**
- **Improved control rotation system**
- **Substrate heater**
 - **For cleaning substrate**

Why upgrade now?



- **Time for Purdue to deliver full size substrates**
- **Time for BNL for setting up reflectivity test stand.**
- **Time for SBU to catch up with thickness measurement**
- **Design a mounting scheme for the substrate**
- **Documenting the optimal coating thickness parameter to the report #2**

During the upgrade



- **Coating setup will resume production if special coating study/request is needed**
 - Making ½ round to help with the BNL reflectivity setup.
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