

Recent mirror Update

12.9.2024

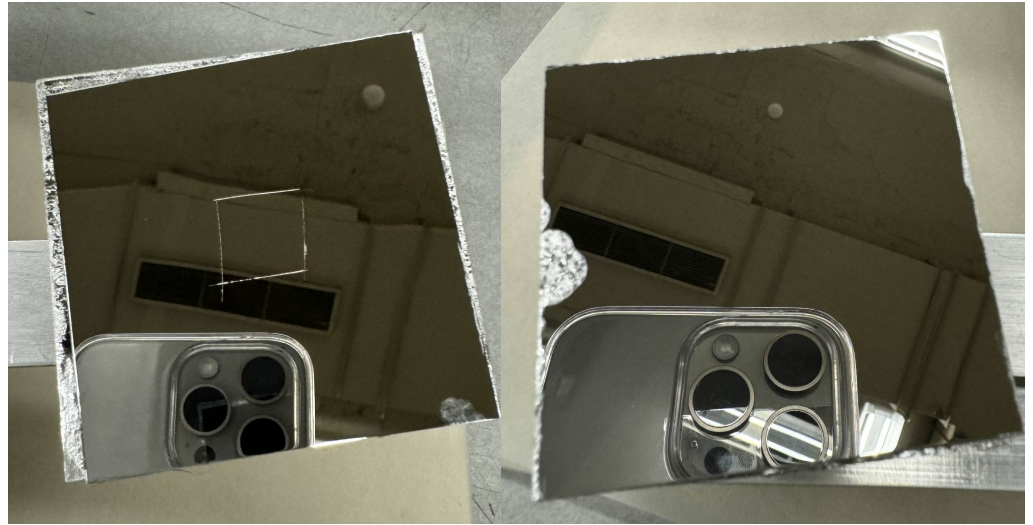
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Overview:

- Reflectivity measurement of Samples 28-29
- **Updated Ratio Vs Reflectivity Data**
- **Updated Rate Vs Uniformity Data**
- Upcoming Efforts:
 - Evaporation Test #30, introducing Purdue Bonded samples for waviness analysis
 - Evaporation Test #31, re introducing SiO₂ to determine recipe changes
 - Week of Dec 16th: Ion Source water cooling branch assembled and bench tested

Coating #28 Results:

- Coating #28 was largely successful; reflectivity results likely to come next week [no waviness + no mechanical failure in chamber]
- Notice, a small disformity on the left edge of image 1. The cause for this is unknown, potentially some epoxy was on the surface of the lexan or other contamination.
- 17 KA Aluminum
- 4 KA Chromium



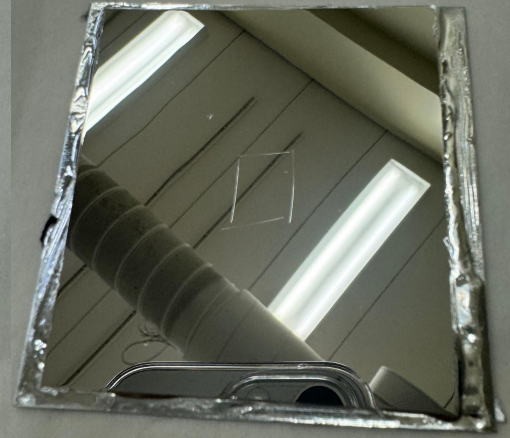
Coating #29:

- High Rate of Deposition Analysis: coating #29 aimed to reproduce peak reflectivity results of coating #20 and coating #26 with 4 KA Cr and 16 KA Al but at a vastly higher rate of deposition
- Typical values for chromium are 15 Angstroms per second at 40 mA as well as 35 Angstroms per second at 180 mA for Aluminum. Coating #29 using new material and crucibles saw 80 Ang/S at 30mA and 100 Ang/S at 120mA respectively.



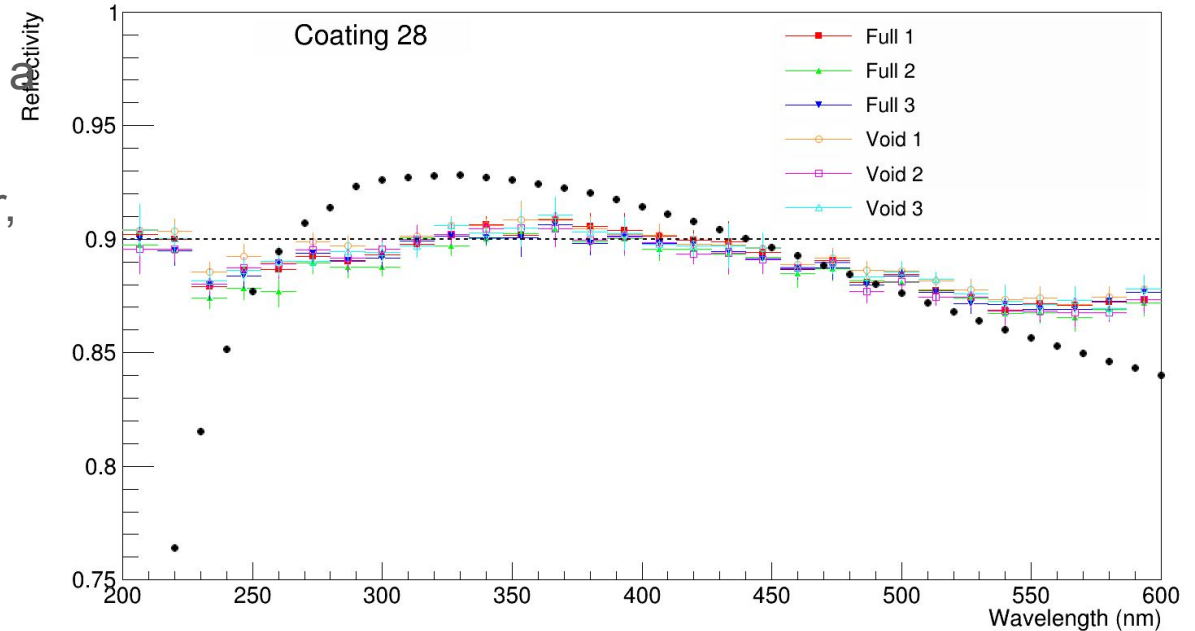
Coating #29 Results:

- Expectations for this coating are a vastly increased variation in reflectivity rather than our usual 1.5%.
- It is notable that this coating saw certain positions be extremely blurry / wavy while other positions appear “normal”



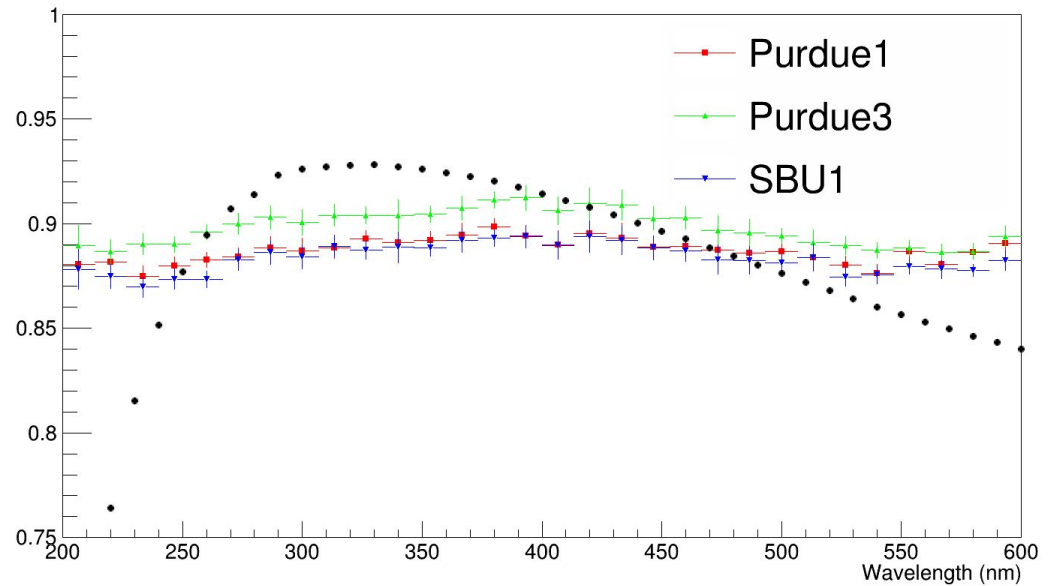
Coating 28:

- All mirrors from Coating 28
- The shape fluctuates bit, which we need to understand. However, results are promising and expected.



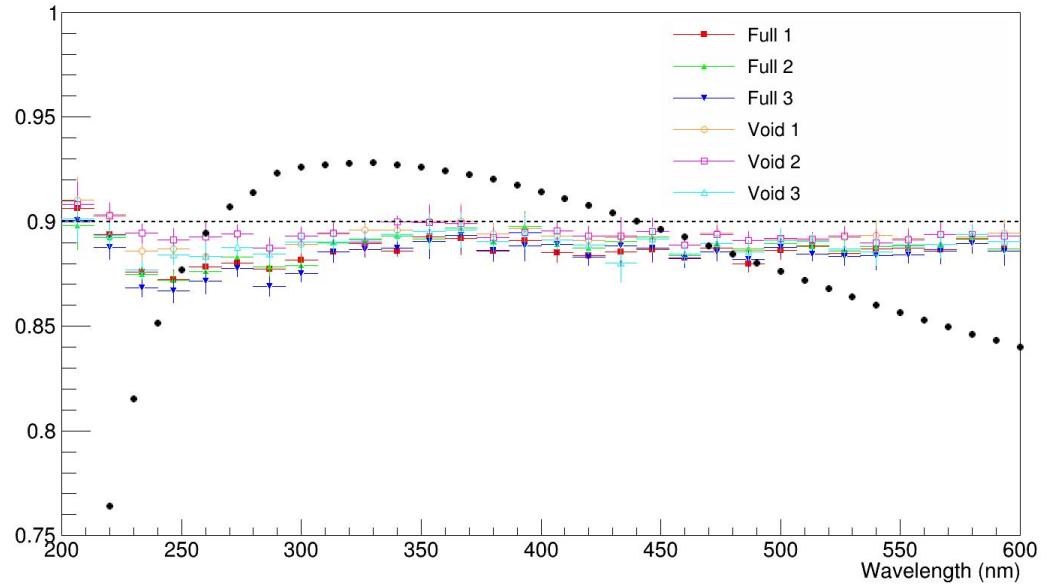
Sample 20

- All mirrors from sample 20

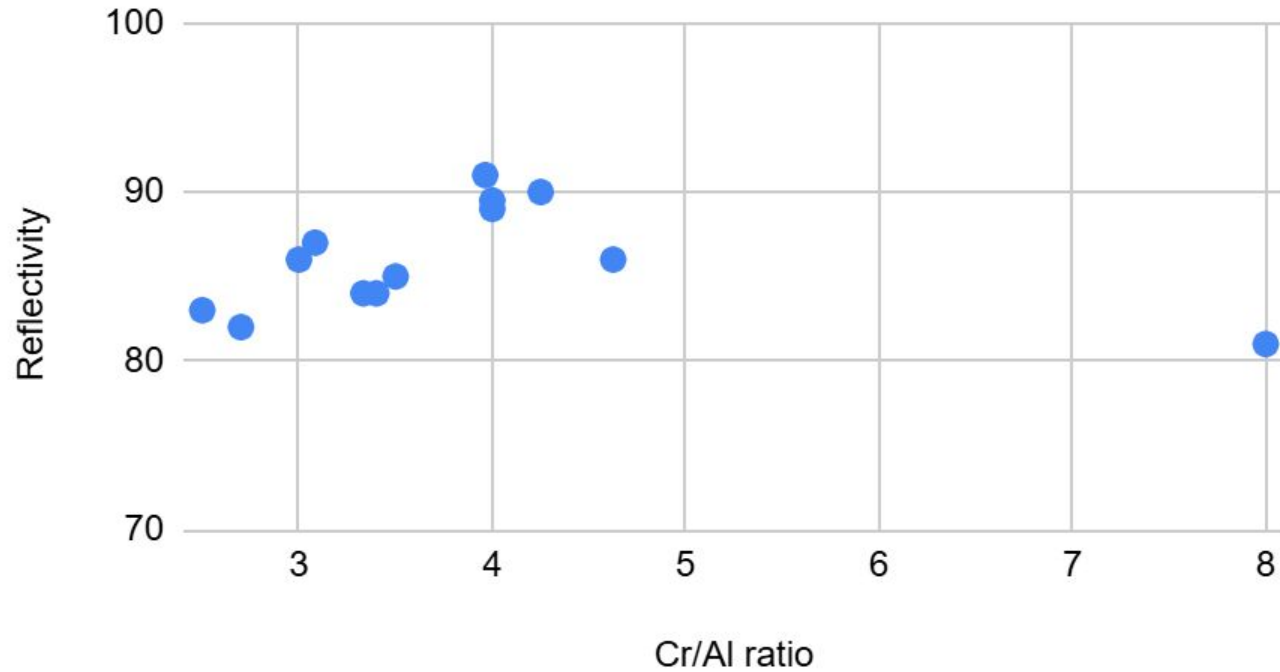


Sample 26

- All mirrors from Sample 26
 - Recipe set the same as coating 20 that had the best reflectivity so far



reflectivity as a function of Cr/Al ratio



Additional Data points near 4 Cr/Al Ratio.

Evaporation #	Relative Deposition Total	Change in Procedure	Avg. Reflectivity
19	Cr: 10 KAng Al: 30 KAng	Introducing more Al	86%
20	Cr: 4 KAng Al: 16 KAng	Reduction of Both Materials	89%
21	Cr: 4 KAng Al: 14 KAng	Micro Void Test	85%
22	Cr: 2 KAng Al: 16 KAng	Micro Void Test	81%
23	Cr: 5 KAng Al: 17 KAng	Increase of Both Materials from previous peak	84%
24	Cr: 6 KAng Al: 18.5 KAng	Increased Both Materials	87%
25	Cr: 6 KAng Al: 20 KAng	Increased Aluminum	84%
26	Cr: 4 KAng Al: 16 KAng	Retesting C20	89%
27	Cr: 4 KAng Al: 18.5 KAng	4.625x Ratio	87%
28	Cr: 4 KAng Al: 17 KAng	Ratio Refinement	89%
29	Cr: 4.1 KAng Al: 16.25 KAng	Testing Greater Rate	91% 200 - 450 nm 87% 450 - 600 nm

Back up Material:

Coating 27

- All mirrors from Coating 27

