New Direct Measurement as Reference

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SBU Side Overview:

Coating Goal Review:

- Previously outlined a **goal of 4 coatings in the week of 06/09** (refer to previously uploaded slides for more details)

- **Coating #41** , Retest coating of sample #40 with the introduction of Purdue Substrate was **completed** . This coating additionally incorporated a single **Clear* JB Weld epoxy bonded sample to test if a better epoxy solution can be found (this sample has no other difference). (4.125 KA Cr, 16.24 KA Al)

- **Coating #42** , tested additional material being added was successfully **completed** . (4.175 Cr, 16.3 Al)

- **Coating #43** , aimed to test a further change of material (4.125 Cr, 16.5 Al) which was **not successful** , midway through the coatings, both chillers died likely due to a breaker being tripped. I suspect the non stop usage of two chillers over multiple days in one outlet drew too much power and coincidentally died midway during the coating. Only (4.14 KA Cr, 10k Al) was deposited, this coating also included a blank lexan (no C.F.) with DP460 painted onto the back for the purpose of testing the transmission of light through the coating into the epoxy which can still be tested.

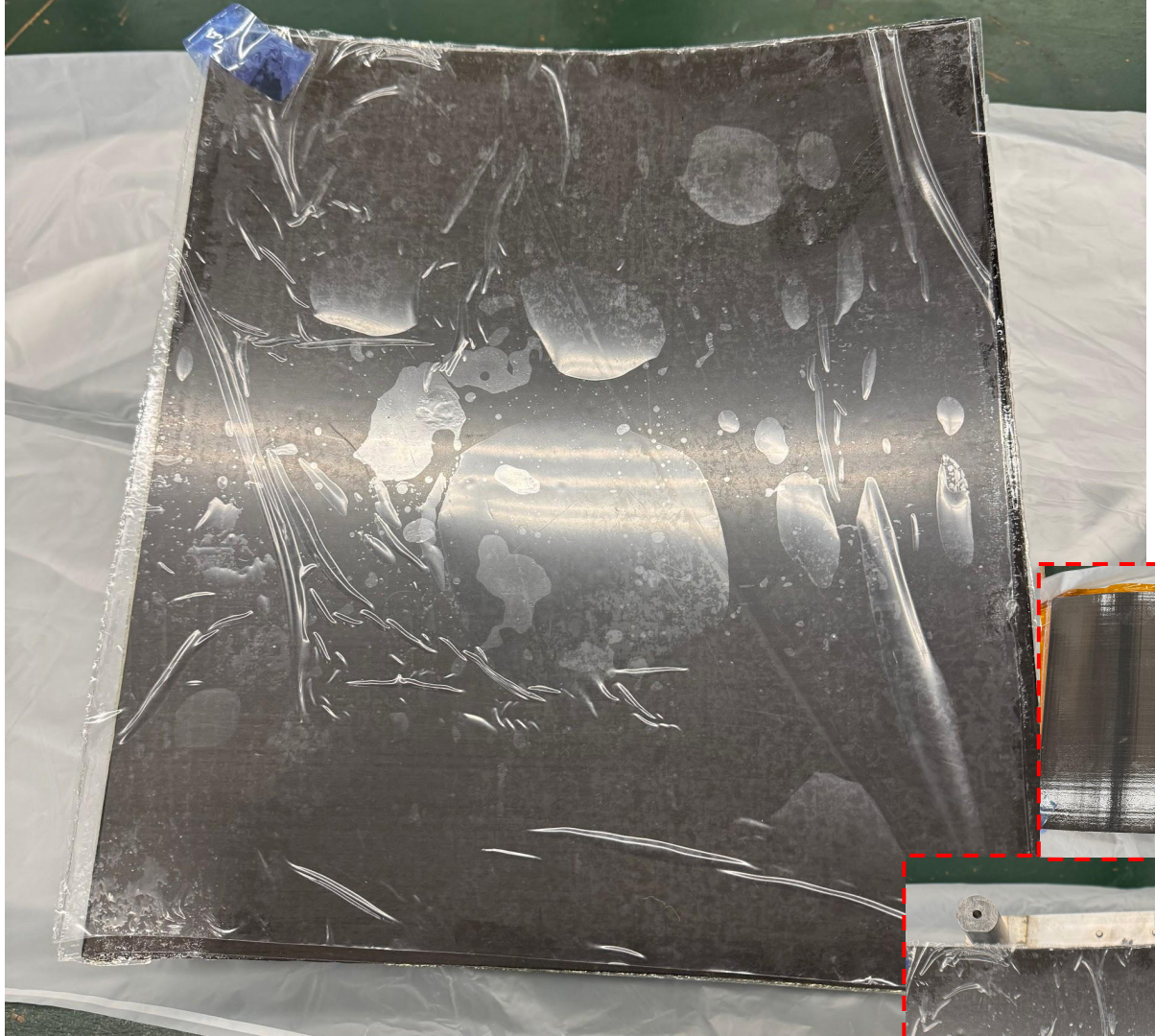
- **Coating #44** , which aimed to test SiO2 was unable to be conducted due to the time loss of the previous coatings chiller issues. This **will be done in the week of 06/16** (currently being prepped.)

Timeline and Upcoming:

- **Purdue full scale curved mirror substrate has been received** . This coating will be a high priority and I aim to have it coincide with the full scale reflectivity stand coming up. Reflectivity results from the aforementioned coatings and a SiO2 test will need to come first, as a result full scale coating **may come early next week (TBD, need info from test stand.)**

- **Both chillers are currently still down** , while they function in other outlets, I do not have the space to move them to a different outlet location easily. I can only access and examine one breaker box (the evaporator space has multiple) which did not seem to resolve the issue and have requested an electrician. (**resolved EOD 06/16**)

- Overall we appear to be largely on track, a **finalization of 90% reflectivity recipe should be re-established in this week** as well as upcoming testing regarding the transmission of light through the film.



* For now we will resort to using tape on the 6 posts to mount this mirror. Future iterations should have the designed threaded ribs to prevent extra stress on the mirror. (pressing down the tape can cause waviness which is very hard to control)

Reflectivity Results:

Major Problem:

We try to replicate the coating with 91% reflectivity from sample 28 at sample 40.

However, we can only achieve 85%.

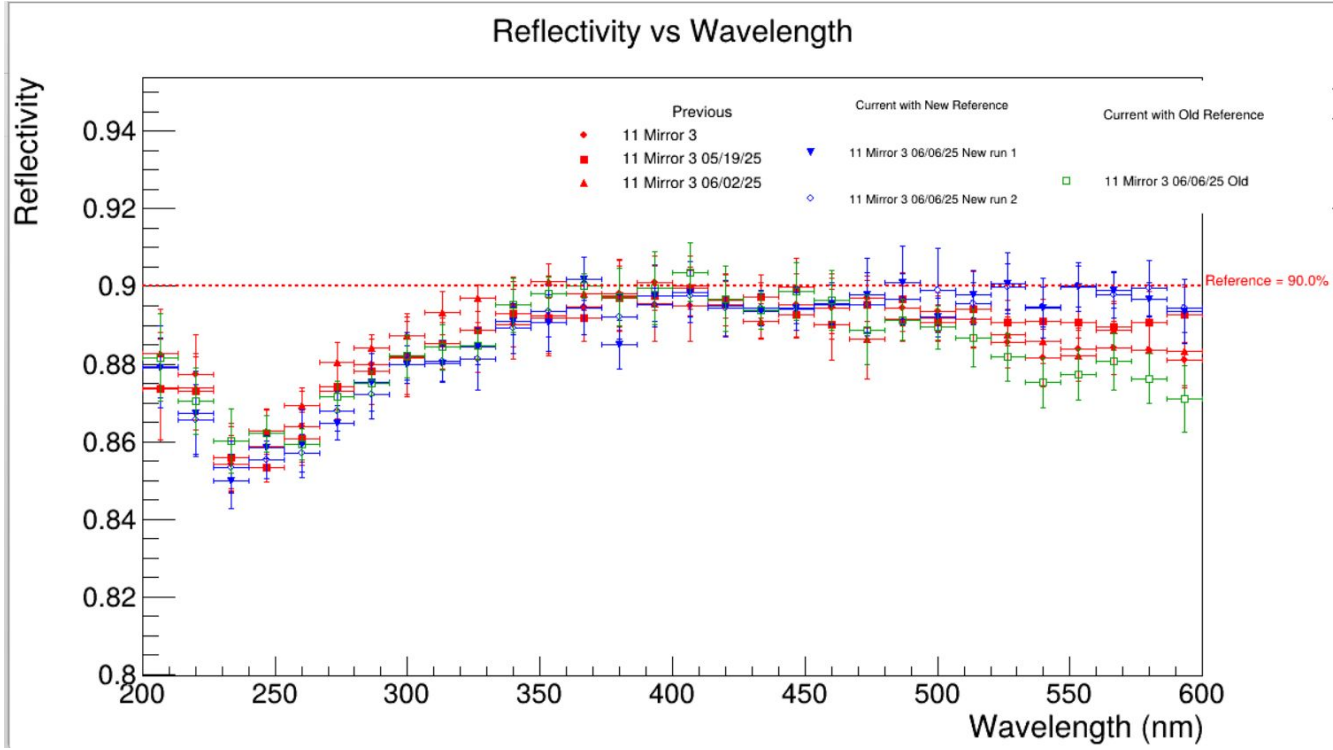
Reference changed to unknown after system change.

So, new direct measurement is taken for reference.

I was able to write my own macro to plot all TH1D from .root files in a specific folder: plot_histograms_from_files.c

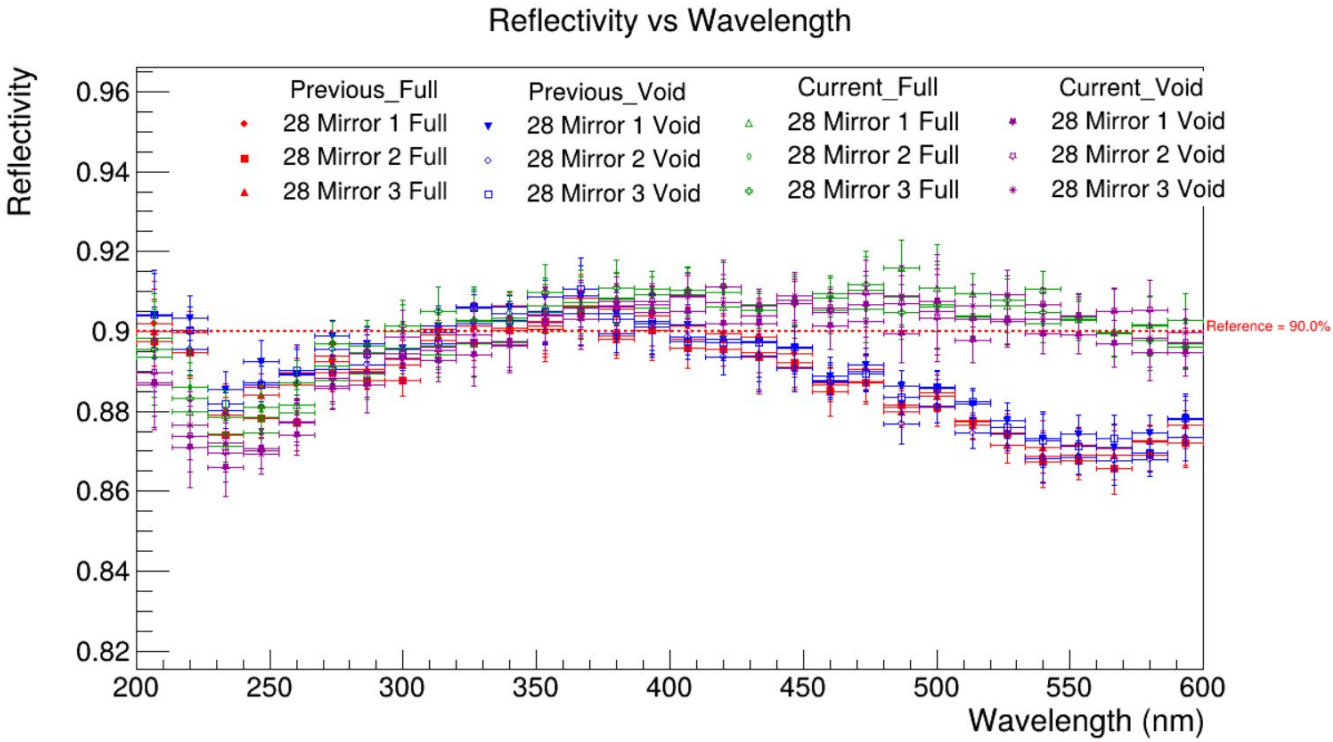
Sample 11 measurement

- Re-take Sample 11 Mirror 3 measurement after system change
- Red indicates the previous measurement results,
- Blue indicates the new measurement with the new reference applied.
- Green is new measurement but using old reference
- Red and Blue are more consistent
- Setting the new direct measurement as reference from now on



Verify Sample 28

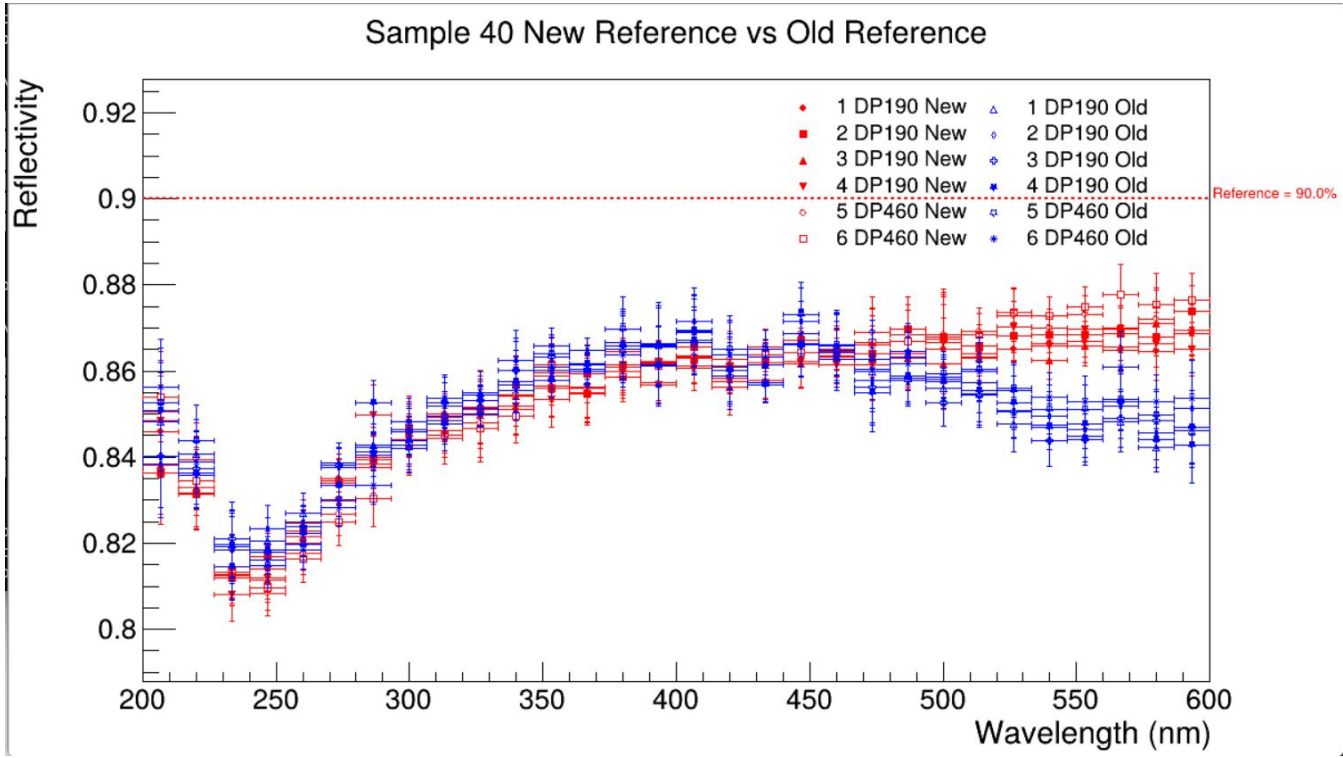
- Re-take Sample 28 measurement
- Previous VS Current measurement with new reference applied
- Fit the prediction curve better, average increased



Sample 40 New Reference vs Old Reference

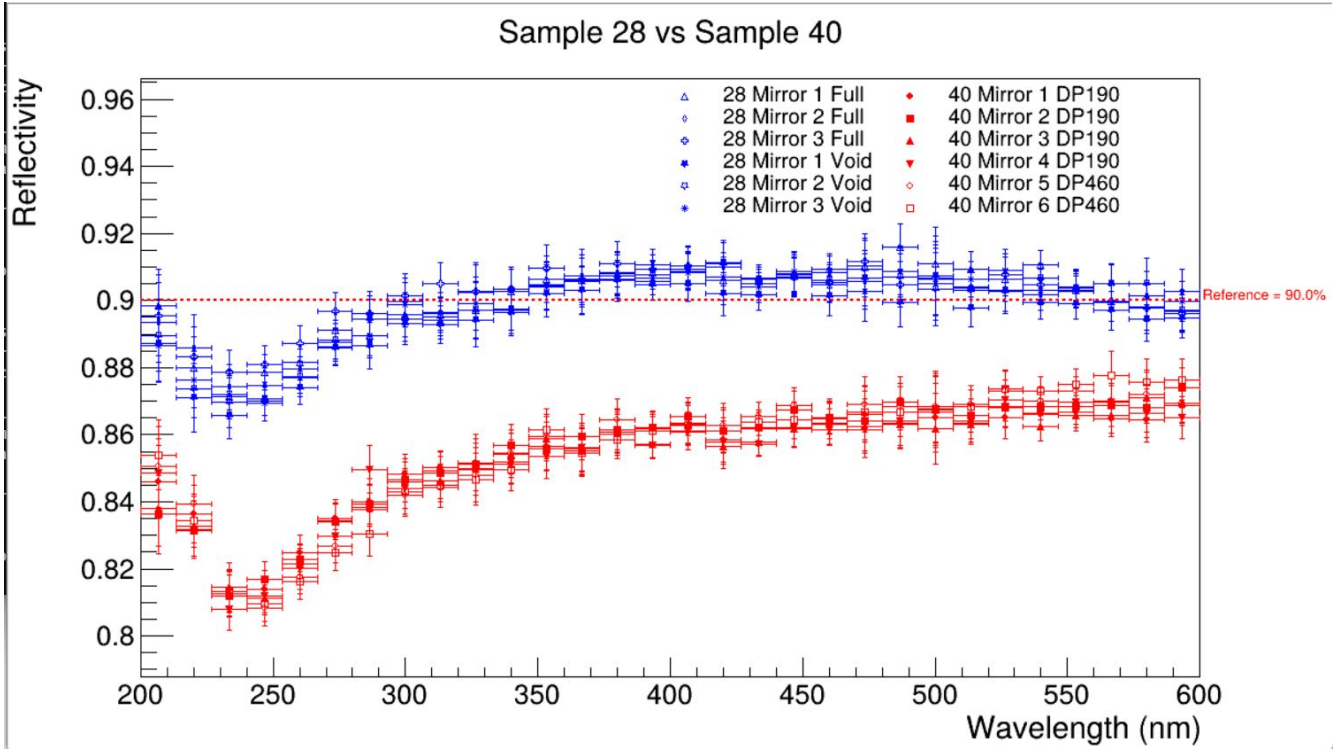
- Same Measurement as last week. Redo Sample 40 reflectivity calculations
- New results in Red;

  Old results in Blue
- New results fit the prediction curve better



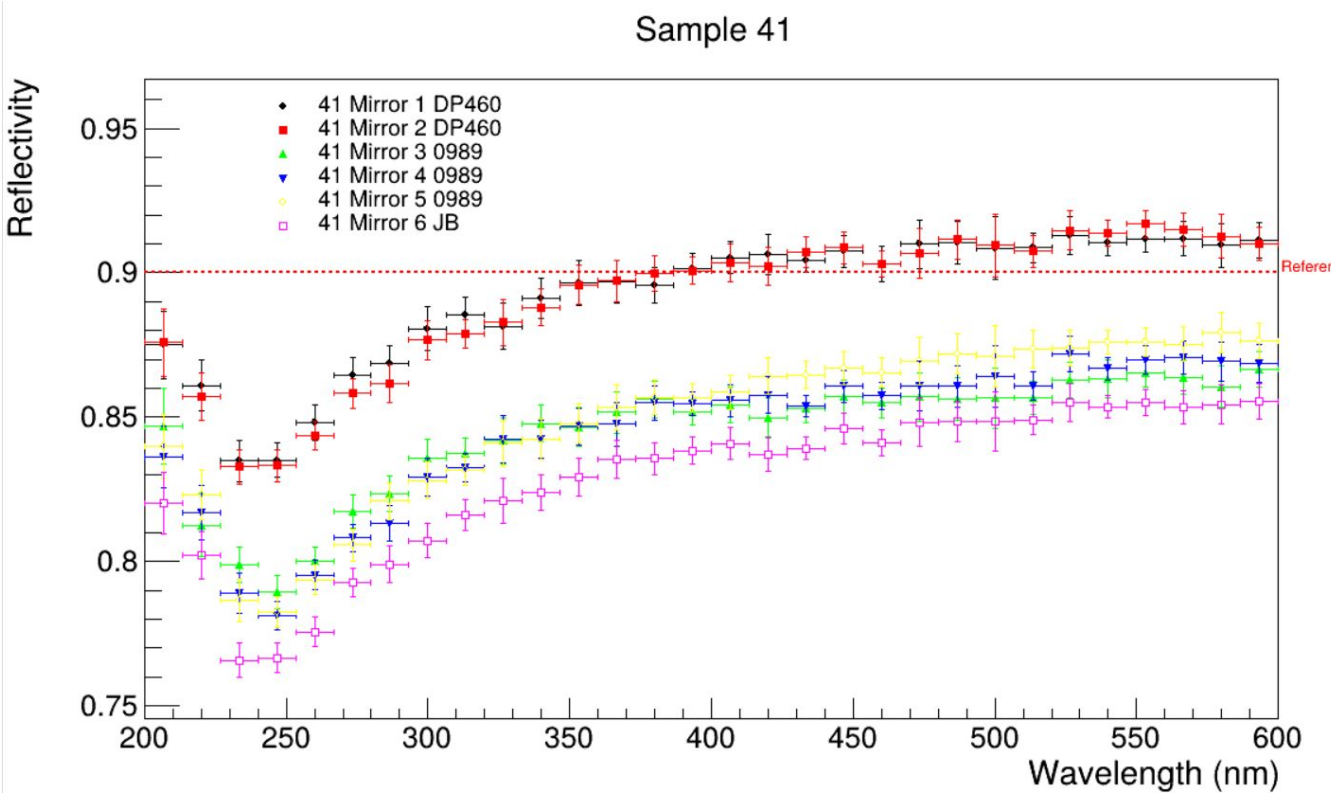
Sample 28 vs Sample 40

- It is just something wrong with the mirror, not system.
- Problems with coating? Or…



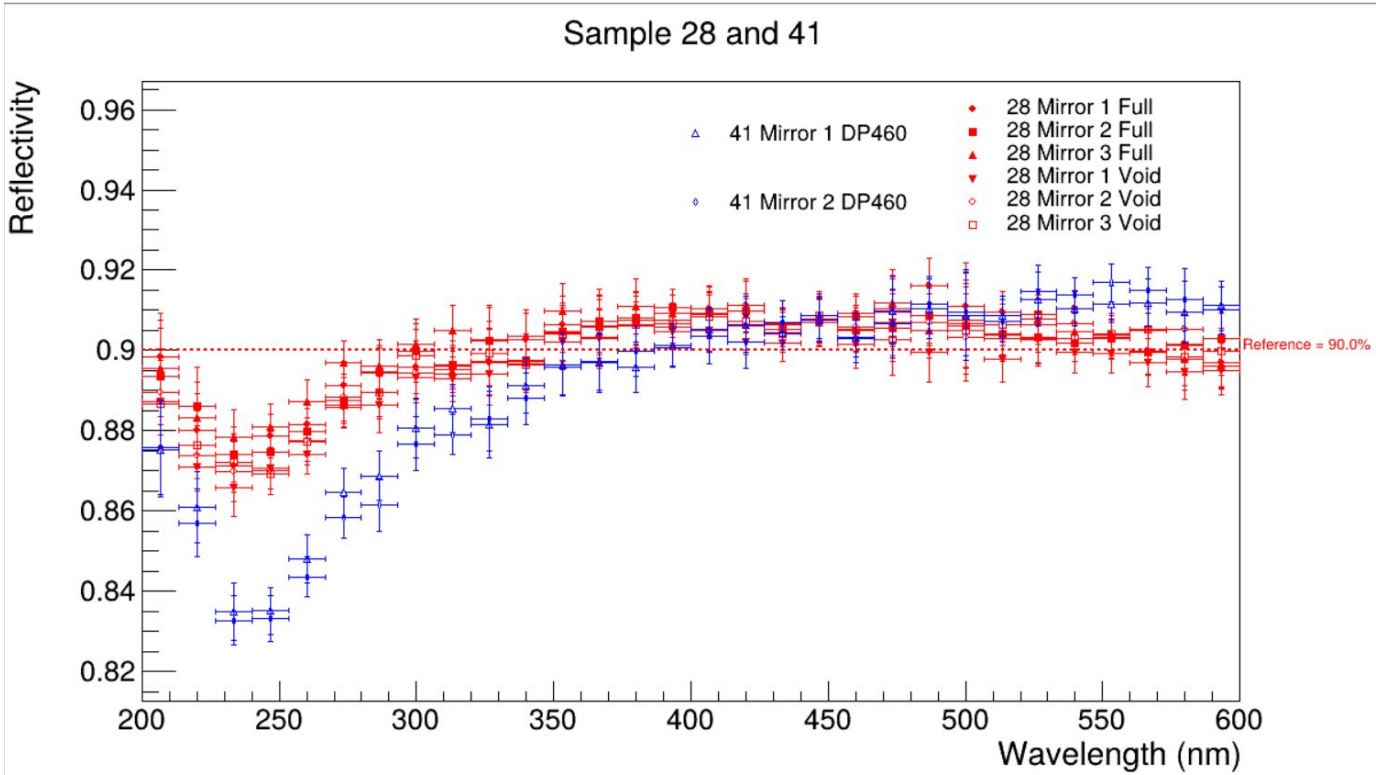
Sample 41

- Mirror 1 and 2 approaching 91%
- JB is not as good as the others



Sample 28 vs Sample 41

- 28's performance is better before 450nm
- 41's performance is better beyond 450nm



Conclusion

New reference make the measurements fit the prediction curve better in general.

Setting the new direct measurement as reference now after system change.

Why sample 40 is lower?

Lexan-only(no glue, no CB) experiment?