To get a FOUNDDACS file to use for calibrating the model, I had to first register on the wall so that that transform could be used to run the certification on all of the wall’s targets.

Judging from my first two attempts at a tracker-less calibration with an un-calibrated projector, it looks like the scale needs to be set accurately for this to work.

**Before setting the scale:**

With nominal model and linear fit, Certification RMS: 0.138”

1st modified model and loess fit, Certification RMS: 0.057”

2nd modified model and loess fit, Certification RMS: 0.055”

Because there wasn’t much of an improvement, I tried registering with 8 targets instead of 6.

3rd modified model and loess fit, Certification RMS: 0.050”

4th modified model and loess fit, Certification RMS: 0.045”

5th modified model and loess fit, Certification RMS: 0.039”

6th modified model and loess fit, Certification RMS: 0.033”

7th modified model and loess fit, Certification RMS: 0.029”

At this point, I figured that this wasn’t a reasonable way to proceed so I manually edited the XGalvoRadiansPerCount and YGalvoRadiansPerCount until I saw the RMS drop

Edited modified model and loess fit, Certification RMS: .015”

8th modified model and loess, fit Certification RMS: .011. I didn’t make new modelparameters with the FOUNDDACS from this cert.

As a sanity check, I ran the same process with the modelparameters and loess files that were made using the tracker and got a .004” RMS certification in the same position.

**After setting the scale:**

With nominal model and linear fit, Certification RMS: 0.070

1st modified model and loess fit, Certification RMS: 0.010”

2nd modified model and loess fit, Certification RMS: 0.009”

This was much closer to what we were expecting from this process.

 Since the registration is what will be used to transform the coordinate data to projector coordinates, I’m thinking we would need some way of recalculating the transform and updating the target coordinates while refining the model parameters. This might be the best way to deal with the cases where the scale isn’t set close enough to the nominal.

I think  I did a reasonable job keeping track of the files created/used throughout this test so if there is anything you would want to see, I’ll hopefully be able to get it to you.

The exact process I use for trackless calibration:

1. Start with nominal projector
2. Register on all calibration points to generate points in projector space
3. Refine the rotation of the projector
4. Refine the translation of the projector
5. Refine the X axis slope
6. Refine the Y axis slope
7. Refine both (X,Y) axis slopes
8. Refine both mirror directions
9. Refine both galvo axes directions
10. Repeat (7-9) once, exit the loop