

Integrated Testing Summary Addendum

March 7, 2013

Since the Integrated Testing Summary was sent around, there have been two further tests of interest. The first involved putting the dichroic and first fold mirror mounts (made of Aluminium) onto the steel baseplate, and bolting them down. This had the much poorer performance than just placing the Aluminium mounts on the steel as expected, and we attribute this to the differential CTE between the two materials. The result from this test can be seen in figure 1.

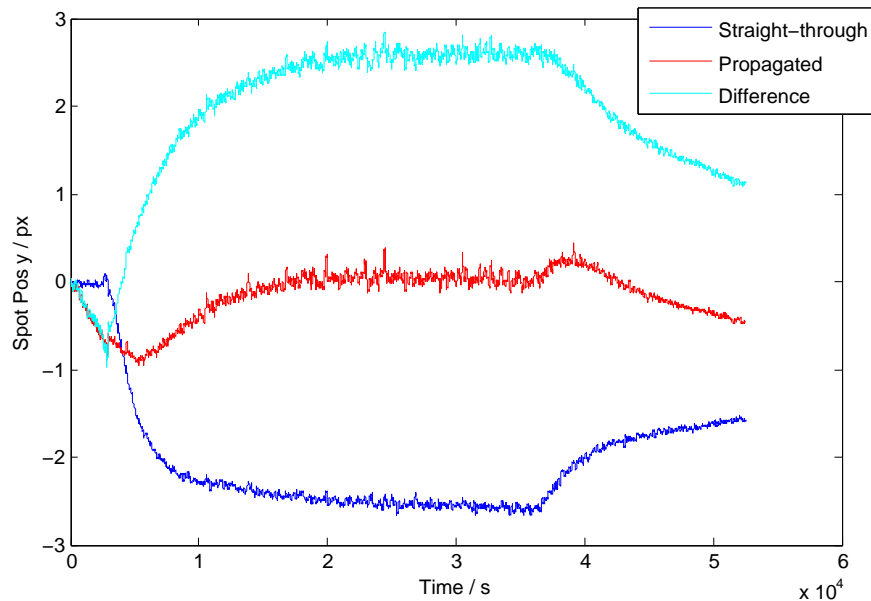


Figure 1: Reduced integrated test with the aluminium mounts bolted to the steel baseplate. Clearly this is poorer performance than with the aluminium baseplate.

The other test of note that has been done is a test where the baseplate was stiffened using aluminium fins made of tooling plate. This result is shown in figure .

This shows behaviour very similar to e.g. Figure 7 in the original document, but crucially with the step size reduced to only one pixel, rather than two.

In light of these two results, we believe that the correct course of action is to further explore the aluminium baseplate and remove a solution based on a steel baseplate from our

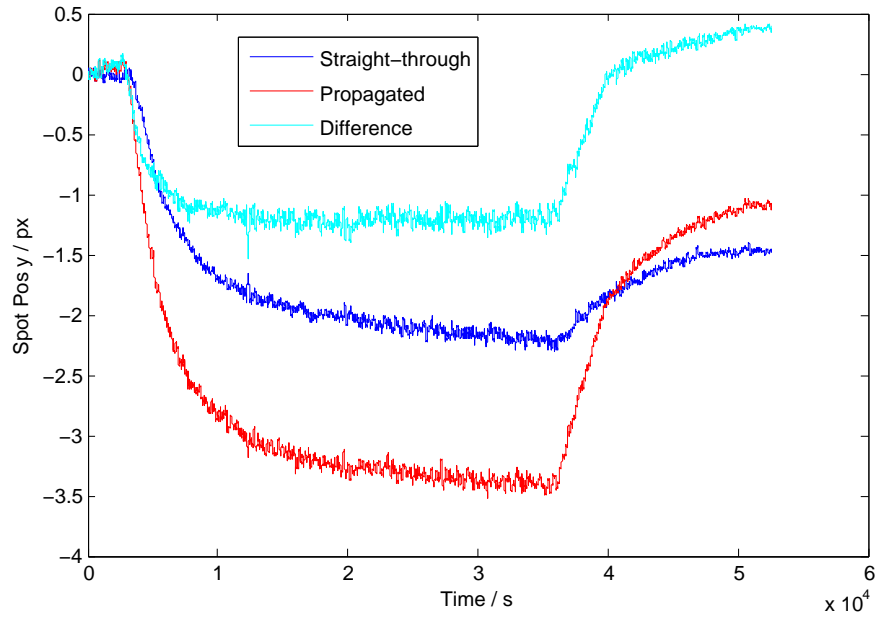


Figure 2: Reduced integrated test with stiffening fins added to aluminium baseplate made of the same aluminium. This performs better than just the aluminium baseplate (by a factor of two), as well as the aluminium baseplate stiffened with a large bar (motion is bounded by the same range, but the behaviour is much simpler and smooth).

consideration. Exploring an aluminium baseplate made of tooling plate with stiffening fins on both the top and the bottom should further reduce this step. It seems unlikely that we will be able to eliminate it completely, however.