



LASER INTERFEROMETER GRAVITATIONAL WAVE OBSERVATORY

LIGO Laboratory / LIGO Scientific Collaboration

LIGO-T1600267-v4

LIGO

07/28/2016

Scan Starting Location Dependency on Previous Location
of Laser

Madeleine Kerr

Distribution of this document:
LIGO Scientific Collaboration

This is an internal working note
of the LIGO Laboratory.

California Institute of Technology
LIGO Project

Massachusetts Institute of Technology
LIGO Project

LIGO Hanford Observatory

LIGO Livingston Observatory

<http://www.ligo.caltech.edu/>

1. Introduction

The purpose of this document is to make clear the lack of correlation between the starting location of a scan under these two different circumstances: 1) pressing the scan button when the laser is at the home position (0,0), and 2) pressing the scan button when the laser is the middle of a scan or at any location that the XY controller can record.

2. Experimental Procedure

The following scan alignment was used to run the experiment: “Optosigma-irradiation-scan-Alena.vi Front Panel.” It was arranged for the 10mm square that the scan normally encompasses to have a 6 by 6 arrangement of points with 2mm steps in between. The delay was set for 3 seconds. The 3 O’clock position was checked before and after every trial using the procedure delineated in DCC document T1600319-v1. Most notably, the “start” position of the run was set to (38.05, 30.05), so specific as to demonstrate the accuracy of the data and to avoid the potential for the “read position” function of the XY controller to round up or down and make the data less valuable. We need the XY controller to return to the same spot with an accuracy of plus or minus .1mm or less.

For more information on how to check the 3 O’clock position, please see DCC document T1600319-v1.

Five trials were conducted, and the results are below.

3. Results

Trial Number	Start coordinates after pressing scan from Home (0,0)	Start coordinates after pressing scan from any location
1	(38.05, 30.05)	(38.05, 30.05)
2	(38.05, 30.05)	(38.05, 30.05)
3	(38.05, 30.05)	(38.05, 30.05)
4	(38.05, 30.05)	(38.05, 30.05)
5	(38.05, 30.05)	(38.05, 30.05)

4. Conclusions

Based on the data above, one can say with great certainty that as long as the 3 o’clock position coordinates are routinely checked, there is no dependency of the start position of the run based on the previous location of the laser beam on the target.