



LIGO Laboratory / LIGO Scientific Collaboration

LIGO-E1200232-v2

Advanced LIGO

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Riser, HAMs 6L, 6H, 12H calculations, aLIGO

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Distribution of this document:
LIGO Science Collaboration

This is an internal working note
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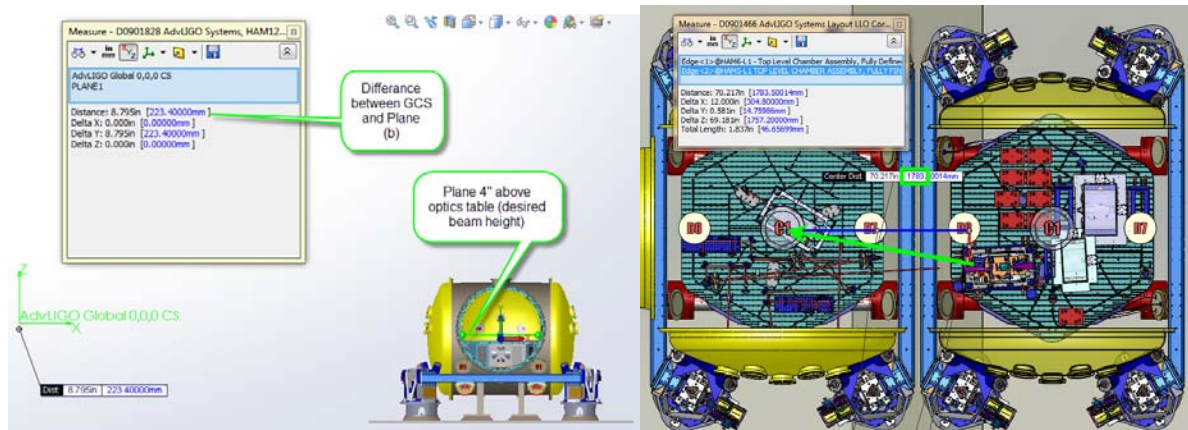
<http://www.ligo.caltech.edu/>

1) Reference Documents:

- 1.1 [LIGO-D0901828-v1](#): AdvLIGO Systems, HAM12-H2 Top Level Chamber Assembly
- 1.2 [LIGO-D0901811-v1](#): AdvLIGO Systems, HAM6-L1 Top Level Chamber Assembly
- 1.3 [LIGO-D0901822-v2](#): AdvLIGO Systems, HAM6-H1 Top Level Chamber Assembly
- 1.4 [LIGO-E1101146-v2](#): L1_recycling-cavity-length-0.076wedge
- 1.5 [LIGO-E1101147-v2](#): H1_recycling-cavity-length-0.076wedge
- 1.6 [LIGO-E1101148-v2](#): H2_recycling-cavity-length-0.076wedge

2) Reference Values from Documents:

- a) Global Coordinate Z value of "Output Faraday Out" beam. (mm)
- b) Position 4" above HAM-ISI Optics table relative to Global Coordinates (measured in SolidWorks Model). (mm)
- c) Global ray vector angle of "Output Faraday Out". (deg)
- d) Distance from output of "Output Faraday Out" to center of HAMs 6s and 12 (measured in SolidWorks Model). (mm)



3) Values:

HAM Chamber	(a)	(b)	(C)
HAM6 L1	-98.2	-223.4	-.034
HAM6 H1	-117.5	-223.4	-.034
HAM12 H2	-152.4	-223.2	-.064

d = 1783 for all chambers

4) Calculations:

$a - b + (\tan(c) * d) = \text{Height of spacer}$

HAM6 L1: $(-98.2) - (-223.4) + (\tan(-.034) * 1783) = 124.1\text{mm} \sim 4.886''$

HAM6 H1: $(-117.5) - (-223.4) + (\tan(-.034) * 1783) = 104.8\text{mm} \sim 4.128''$

HAM12 H2: $(-152.4) - (-223.2) + (\tan(-.064) * 1783) = 68.8\text{mm} \sim 2.709''$