

**Subject:** [Aligo\_sus] pitch angular alignment between test and penultimate masses GEO  
**From:** Caroline Cantley <c.cantley@physics.gla.ac.uk>  
**Date:** Wed, 21 Apr 2004 08:38:12 +0100  
**To:** "Aligo\_Sus@Ligo. Caltech. Edu (E-mail)" <aligo\_sus@ligo.caltech.edu>  
**CC:** Gianpietro Cagnoli <g.cagnoli@physics.gla.ac.uk>

Statement from Geppo on pitch angular alignment between test and penultimate masses in GEO.

----- Original Message -----

Subject: Re: [Fwd: angular alignment in GEO600]  
Date: Tue, 20 Apr 2004 18:14:21 +0100  
From: Geppo Cagnoli <[g.cagnoli@physics.gla.ac.uk](mailto:g.cagnoli@physics.gla.ac.uk)>  
To: Caroline Cantley <[c.cantley@physics.gla.ac.uk](mailto:c.cantley@physics.gla.ac.uk)>  
References: <[40854E43.3050400@physics.gla.ac.uk](mailto:40854E43.3050400@physics.gla.ac.uk)>

Based on the GEO experience and considering the different parameters for LIGO the pitch angle error between the last masses is:

- longitudinal positioning of the ears with respect to the c.o.m. (+/- 1 mrad)
- manual positioning of the fibres (+/- 5 mrad)
- difference in the fibres cross section (+/- 1 mrad)
- machining and assembly errors in the catcher (+/- 0.1 mrad)

Adding them in quadrature the total error I would expect in the LIGO suspension using a manual technique as in GEO is about 5 mrad = 500 times what they expected.

Geppo.

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Dr. Caroline Cantley  
Institute for Gravitational Research  
Kelvin Building  
Glasgow University  
G12 8QQ Scotland

Tel: + 44 (0)141 330 5880  
Fax: + 44 (0)141 330 6833  
Web: <http://www.physics.gla.ac.uk/~caroline/>

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Aligo\_sus mailing list  
[Aligo\\_sus@ligo.caltech.edu](mailto:Aligo_sus@ligo.caltech.edu)  
[http://mm.ligo.caltech.edu/mailman/listinfo/aligo\\_sus](http://mm.ligo.caltech.edu/mailman/listinfo/aligo_sus)