

**Subject:** RE: [Aligo\_sus] Meeting with members of the ALUK team  
**From:** "Greenhalgh, RJS (Justin)" <J.Greenhalgh@rl.ac.uk>  
**Date:** Tue, 21 Oct 2003 01:52:26 +0100  
**To:** "aligo\_sus@ligo.caltech.edu" <aligo\_sus@ligo.caltech.edu>, "sma@star.sr.bham.ac.uk" <sma@star.sr.bham.ac.uk>

Hi Calum,

Thanks for your summary. A quick response to you questions, and in each case a question of my own that I suggest we discuss at the telecon if Janeen can fit us in.

a) I think you are referring to my comment that as far as I could see the mass of clamp would not be a driver on the design. Essentially this comes from thoughts on the effect of the clamp on internal modes of the blade/wire clamp/wire system. I had planned to raise this at a weekly meeting, and this is as good a time as any. My understanding of Ken's note (ALUKGLA0007) was that, provided we stayed well above about 40 Hz, then internal modes of the system should not be a problem. (it was in response to a query on this subject that he wrote the note.) Back-of-envelope calculations given in ALUKRAL0017:

[http://www.eng-external.rl.ac.uk/advligo/papers\\_public/ALUKRAL0017\\_nat\\_f\\_wires\\_blades/](http://www.eng-external.rl.ac.uk/advligo/papers_public/ALUKRAL0017_nat_f_wires_blades/)

suggest that a clamp mass of 50 grammes would be OK from that point of view. My conclusion is that we should regard a 50 gram number as a limit on clamp mass - SUBJECT TO FURTHER CHECKS. Since that should not be hard, we don't need to worry unduly about minimising the mass of the wire clamp. Once we have a design then an FEA check should be made. I am hoping Ken has kept me from barking up the wrong tree completely, but does anyone know of any other limits on clamp mass?

b) Yes, we should bear in mind the possibility of sacrificial shims in a wire clamp. What things should we do to avoid introducing (technical) noise? I am guessing that at least we need to ensure that the edges of the shim don't overhang the clamp on the side where the wire breaks away. Any other thoughts?

c) Yes, a creep test would be good idea. Is this because we are worried about dimensions changing, or because we are worried about micro-slip events causing noise?

Speak to you soon - Justin.

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

From: [aligo\\_sus-admin@ligo.caltech.edu](mailto:aligo_sus-admin@ligo.caltech.edu)  
To: [aligo\\_sus@ligo.caltech.edu](mailto:aligo_sus@ligo.caltech.edu); [sma@star.sr.bham.ac.uk](mailto:sma@star.sr.bham.ac.uk)  
Sent: 20/10/03 19:08  
Subject: [Aligo\_sus] Meeting with members of the ALUK team

Dear All

I thought I would summarise some of the discussions I had at the end of last week with Justin, Caroline, Stuart and Ian at a meeting at the end of workshop to discuss work practises etc ...

Ian and Justin - could you help me clear up a couple of the comments you made, see section 4 below?

Stuart - Can you add yourself to the aligo\_sus user group?

Topics

1) SolidWorks (Research Edition)

I brought up the fact that as far as I am aware all of the groups currently involved in design for Advanced LIGO are using SolidWorks. Therefore, I posed the question of whether or not RAL could adopt it as there CAD package of choice especially in light of the fact that Glasgow has committed to update to 2 SW Research licenses. (At only ~ \$1000 a seat and with home written tutorials which allow any competent CAD user to become familiar with it in a couple of days I thought this was a valid question)

RAL currently use Pro-E and will continue to do so for the work highlighted in section 4 below.

ACTION: - However, it was agreed that we will re-visit this question again in a few months after we have had some experience exchanging, sharing and storing files.

ACTION: - Ian Wilmut agreed to go through the LIGO SolidWorks tutorial, written by MPL, during his planned visit to the IGR in Glasgow.

We tested the ability to exchange files between SW and PRO-E using the universal file of .STEP and found it to be acceptable if not ideal!

2) Fasteners

At present we agreed to use imperial fasteners. In particular something like oversized taps, silver plated screws in s/steel, Military spec. screws in Aluminium and MS washers and nuts will also be used. (A similar toolbox to the one created for use with SolidWorks, by MPL and Calum, will be used.)

3) Tools for CAD

It was agreed that the concepts suggested by MPL and Calum that aid in designing in CAD could be adopted in PRO-E with discussion.

See section 2 at

<http://www.ligo.caltech.edu/~ctorrie/SUS%20WORKSHOP%201/sus%20workshop%201.html>

<<http://www.ligo.caltech.edu/~ctorrie/SUS%20WORKSHOP%201/sus%20workshop%201.html>>

4) Documents, sent on email on October 9th and available at

<http://www.ligo.caltech.edu/~ctorrie/RAL/Interaction%20with%20RAL.html>

<<http://www.ligo.caltech.edu/~ctorrie/RAL/Interaction%20with%20RAL.html>>

a) Internal Mode

Could you clear up the comment you made regarding the mass of the clamp wrt the internal mode of the blade, as per the specification in the papers by Norna and Ken Strain? I think I was confused or mis-understood what you said regarding this matter?

b) Re-usable Clamp

In light of the modular nature of the current "clamp-wire-clamp" assemblies and with a view to making most of the clamp re-usable perhaps for example disposable shims or similar should be considered as an interface between wire and clamp?

c) Creep-Test

It might be a good idea to set up a creep test with any new design of a wire clamp assembly?

Perhaps some of these topics should be discussed at the weekly SUS meeting? Please let me know if there are any questions or comments relating to my summary?

Cheers, Calum

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