Minutes of the Core Optics Subgroup, 11/8/01

9 am PST US/Europe meeting

CIT: Gari B., Bill K.
MIT: Gregg H., Peter F., David S.
Glasgow: Jim H.
Stanford: Roger R., Norna R., Sheila R., Marty F.
UF: Dave R., Guido M.
Goddard: Jordan C.

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1) Coating Status (Gregg)

Gregg and Helena met with Jean-Marie Mackowski in Lyon to discuss plans for investigating coating effect on Q. They discussed having one of the thicker samples not coated, but cleaned and annealed and sent back for measurement. The result is 3 instead of 4 samples in one run. Jean-Marie wants a more formal agreement than we have at present, when Helena returns she will handle the process.

Gregg discussed the possibility of moving the 30 layer 3λ/8, λ/8 run to later and replace it with a 15 layer λ/2, λ/2 run to look at how Q scales with thickness. An animated discussion ensued, concerning the merits of each particular run and possible schedule problems if we add an extra coating run to the SMA-Virgo schedule (Jean-Marie wants to coat the first VIRGO mirror by December; this is the restriction for Lyon). Ultimately, it was decided to leave the original plan in place, based on the observation that the 3λ/8, λ/8 run gives a lot of qualitative information about Q loss.

Gregg pointed out that Jean-Marie had not discussed annealing temperatures. He wants the Q experiments done blind, but then has no problem sharing temp data at a later time.

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2) Polishing Status (Gari)

Goodrich is still working on their compensating polish and looking at the difference in results between small and large samples.

The homogeneity of a-axis sapphire is looking more promising than m-axis. The one measurement which has been made exactly shows a homogeneity of ~ 13 nm rms in an 80mm thick piece. Interestingly enough, the 50 mm thick piece has a very similar rms with comparable spatial frequencies. This seems to rule out a wandering optical axis and perhaps indicates a common internal defect. A-axis pieces show the same structure as the m-axis. C-axis pieces do not show this type of inhomogeneity with the one large piece we have giving an rms of 3nm. There was considerable discussion about the cause of these inhomogeneities. Jordan believes that it is a surface effect, and strongly urges a surface damage investigation

3) Sapphire Absorption (Roger)

The new lab is nominally functional, with Vladimir up to speed on Alexometry. Vladimir is focused on surface contamination.

18 windows have been received and have been cut in half for comparison testing between Crystal Systems annealing and Stanford annealing. Most of the halves will be sent back to CSI. They have done 20 scans, and have low spatial frequency that which may be related to surface loss. This needs more investigation; measurement error has not yet been ruled out.

The new furnace is expected at Stanford in 1-2 weeks.

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4) Q measurements (Gregg, Sheila)

They have received first 4 fused silica samples. The highest Q is 1.8e7. The lowest is 2e6, but this is almost certainly suspension limited (this piece also has damage on the barrel). Of the 4, 2 samples have chips in them. All 4 pieces will go to SMA on 12 Nov. 1. One will be cleaned and annealed only; the other 3 will be coated. This should be completed by Nov. 21. The Q folks are waiting on the next set of substrates from Helena.

Steve Penn has measured 1.1e7 to 2.4e7 in 2 modes (butterfly) on his samples. Drumheads are tougher to grab. He'll have 1 sample ready to go to SMA for the upcoming run.

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5) Wrap up, upcoming deadlines (Gary)
- None reported; Gary was tied up in another telecon…

5:30 pm PST Telecon

CIT: Gari
UWA: David B., Ju L.
UF: Dave

David suggests annealing trials for the coating/Q work, as Q has been shown to depend on annealing process in niobium samples. A preprint of their results is available at http://www.gravity.uwa.edu.au/publ/Igor.pdf

Gingin has received AU$4.83M in funding. David McClelland will be coming over to take a leadership role at Gingin in the future. They are interested in staffing up at Gingin, 2-3 year positions. **Please notify people in your groups of research positions available at Gingin. Interested parties should contact David Blair or David McClelland.**

2&3 Dec will be the Aus. consortium meeting at Gingin.