

Report of the 40 m TAC 7th June 2007 LIGO-T070136-00-R

K.A. Strain for the 40m TAC

June 8, 2007

June 7th 2007 40 m TAC telecon minutes

Attending

Rana Adhikari, Osamu Miyakawa, Rob Ward, Ken Strain, Valera Frolov, David Tanner, Peter Fritschel, Alan Weinstein, Steve Vass, Tobin Fricke, Eric Gustafson.

Minutes

Rana led a presentation reviewing progress over the last 4 months.

See http://lhocds.ligo-wa.caltech.edu:8000/40m/TAC_Meeting-June_07

We congratulate the team on the completion of the first phase of the squeezing experiments, as well as making considerable progress with DC readout.

Several issues were raised in general questions, mostly after the presentation.

There was discussion of the proposal to investigate excess mirror loss. It was concluded that this is certainly worthwhile as it could contribute to our general understanding of mirror contamination and defects. The timescale for this work is over the next few months.

There was some discussion of how the 40 m program could guide the last steps of development of the DC Readout for Enhanced LIGO (on a timescale of months). Overall it was felt that even relatively late discovery of potential problems with the OMC or other aspects of the technique would be valuable. In any case the immediate aim is to understand the measured noise couplings within the next couple of months.

The need for a lead scientist for any major 40 m initiatives was noted. In particular the Advanced LIGO LSC work is high priority, and there is an immediate need for a lead scientist for the approximately 1 year duration of the experiments. Further, if there is to be another phase of squeezing experiments it will be necessary to identify someone to lead that.

The team asked the TAC to consider the proposed activities highlighted on page 15 of the presentation. The TAC agreed that the tasks in the left panel are the correct high-priority activities (and include the LSC work mentioned in the preceding paragraph).

The activities in the right hand panel are interesting, and should be kept in mind, but cannot be prioritized in detail at this stage. Some comments regarding these are recorded here:-

- ASC/wavefront sensing – a very challenging commitment, to be undertaken only when there is a clear demand from Advanced LIGO ISC, and after review of a proposal. Note, however, that consideration should be given to cavity g-factors at any time when replacement optics are being procured.

- Multi-color coatings – this is an interesting side experiment. At this stage it is worth giving some thought to the practicality of the scheme (watching how mirror design progresses, etc.) but it is not time to identify when an experiment could be undertaken.
- Lightweight ITMs – a reasonable option to consider if ITMs are to be replaced (e.g. as part of the LSC work). Has the benefit of a higher optical spring frequency that should challenge locking. Not seen as a very high priority at the moment
- New optical lever design – this could become interesting if better components emerge from other research.
- More squeezing – requires a proposal.
- SPI with STACIS – opportunity to look at SPI techniques. Not completely convincing that the 40 m provides the right test bed for this, although it certainly meets some of the requirements.

These are all interesting projects and none are ruled out.

The TAC suggests that the team continues to develop these outline ideas, and starts to assign priorities (with input from the Advanced LIGO project). The TAC suggests that these priorities, where available, be used to make a very simple schedule, showing roughly how new activities would fit into the overall timeline (around the higher priority tasks). Such a schedule would certainly help the TAC comment on the practicality of new proposals, and the team is encouraged to provide one at future meetings. (It is certainly fine to do this by updating the schedule the High Level Schedule on the 40 m wiki – it is currently out of date.)

In summary progress on the important work undertaken by the 40 m team continues to be very good.