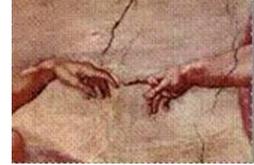




ASPERA Common Call

ET R&D

Networking and R&D for the Einstein Telescope



Meeting Minutes

| WP1 | WP2 | WP3 | WP4 | MC | GM | Other |
|-----|-----|-----|-----|----|----|-------|
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|------------------------------|--|
| Title of the Meeting: | Management Committee Meeting, Telecon, |
| hyperlink: | |
| Date: | 24/07/2015 |
| Location (or phone) | phone |

| Participants | | | |
|--------------|--------------------------------------|----|---|
| 01 | Harald Lück (author of the notes) | 02 | Tania Regimbau as proxy for Sathyaprakash |
| 03 | Ronny Nawrodt | 04 | Stuart Reid |
| 05 | Iain Martin | 06 | Mathyas Vasuth |
| 07 | Jerome as proxy for Matteo Barsuglia | 08 | |
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| 17 | | 18 | |
| 19 | | 20 | |

Agenda

- status of the work in the WGs
- news from individual partners
- date for next meeting
- AOB

With 7 out of 11 members of the ET R&D MC participating in the meeting the required threshold of 3/5 according to our MOU was reached, making this a valid MC meeting of which we agreed to have at least four per year.
Jo intended to send Alessandro Bertolini as proxy.

Valentin Rudenko sent a report on work that happened in Russia:

1. concerning the works in the frame of W2

in past year we calculated of spectrum of Newtonian noises along the Baksan site tunnel in the frame of simple Saulson model when noises of mirrors separated at $l=1\text{km}$ are considered as independent/

Now we have got data of synchronous seismic measurements at the three points along the tunnel and we are in the process of calculation of the correlation level of these noises (then we will use it to reduce the Newtonian background) This work we are doing in cooperation with La Sapienza group (lead by Fulvio Ricci) we hope to get these results at the final report time (before the end of November)

2. concerning the cryogenic mirrors W3

we performed the experiment with mixed pair of mirrors at FP cavity: one is CaF₂ (spherical) and second from "sital" (russian zirconium) we went through 300 K down up to 4 K measuring the variation of Finesse and contrast. (Ronny have got from us some illustrations with it)

now we are in the process of making the same experiment in a more pure manner: at two CaF₂ mirrors with Finesse 3000. At the moment the model of Aluminium FP cavity with these mirrors attached and tuned is in the cryostat with good vacuum. But the cooling experiment was postponed at September.

Our general plan is to finish this experiment with CaF₂ and then repeat the same measurement with sapphire mirrors. So in our final report in November we'll present the both results with CaF₂ and sapphire mirrors.

I believe that works in Vyatchanin's section W4 he will inform you separately

Status of the working groups:

WG1: Tania as representative for WG1

Two mock data challenges have been done. The team produced signals for the second one and started four different analyses. Compact binaries up to $z=10$ with 1 event every 200 seconds, burst, SuperNova and ringdown analyses.

One analysis is completed – a search for long compact binary inspirals down to starting frequencies of 5 Hz, where the individual inspiral lasts between a few hours and days. A resulting paper will be submitted around September. The results could be improved compared to the first MDC, which only went down to 10 Hz. The team was able to separate sources and reduce the false alarm rate considerably. The estimated source parameter (mass and distance) error bars could be improved by an order of magnitude. The mass estimate error bar is smaller than 1%. Individual binaries could be extracted up to $z=5$. The rest forms a background after removal of individual sources.

In the burst search and search for intermediate mass black hole binaries loud events could be extracted, but the distance could not yet be recovered well.

The team is about to start the third MDC around October.

This time they will focus less on analytical aspect than on the science to be extracted, i.e. parameter estimation and cosmology.

All available methods to constrain dark energy will be used for analysis.

Many team members are busy with preparations for (and later the conduction of) LIGO data analysis, such that fewer people are remaining for ET work.

WG2: no representative of the working group present.

Mathyas Vasuth reported on the Hungarian efforts:

There was a small delay in the construction of the seismic station for the Matra mountains. The construction of concrete cubes hosting the sensors will be done in August. Testing of the sensors from the Polish group will take 2-3 month and then a long term data taking period will start. The sensors and DAQS themselves are ready.

WG3: Ronny Nawrodt: Preparations for the cryogenic birefringence measurements have substantially been done and the experiments will be performed in August and September. Discussions between Jena and Glasgow on the details of the collaboration are ongoing. The Russian side is making some limited progress. There has been no feedback on the whispering gallery mode work. Ronny will enquire again. We know that some work with Silicon is going on there but do not have any detailed information of status nor on experiments performed.

Ronny reported that he Russian group has done some Finesse measurements of a CaF₂ cavity over a wide range of temperatures (see also Valentin's report above). Results have not yet been reported.

Silicon surface tests still need to be done. Such tests (AFN and STM) will be performed in Jena in the summer. The enhanced surface absorption still remains a mystery, but can be removed by proper polishing.

WG4: no report. Conor Mow-Lowry was named as a representative by Andreas but was out of e-mail contact and only realized after the meeting.

Harald Lueck reported on some work done in Hannover on ET LF control signals, verification of the ET LF sensitivity curve (or rather attempts thereof), analysis of effects of the long distance between ITM and SR mirror (keyword: twin signal recycling) and simulations of filter cavities for squeezing with FINESSE. Attempts to reproduce the DS sensitivity curve for ET LF so far failed and all different codes yield slightly different sensitivities. Analysis is ongoing.

Additional info from the labs:

Glasgow Uni: (audio was pretty poor. Not sure I understood everything correctly)

Iain reported that surface absorption could be removed by re-polishing surfaces. Angus is writing a paper on the results. Homogeneity of large pieces was tested and inhomogeneities at a 4ppm level and a slight gradient found. A birefringence experiment is discussed together with Jena.

Jerome reported that LMA is currently concentrating on advanced metrology for the second generation, i.e. measuring the refractive index of coating layers and physical properties with various methods e.g. nano indentation.

Uni of the West of Scotland: Stuart: they have set up an IBS system and coated the first amorphous silicon film. Analysis of these is ongoing.

Tentative date for the next meeting: October 23rd. 10:30 CEST