STAC meeting Cascina, 7-8 May 2013

Participants:
Harald Lück, Luc Blanchet, Fabio Bossi, Hartmut Grote , Edward K. Porter , Christophe Salomon, Guido Zavattini, Roberto Battiston, David Shoemaker

General remarks

The STAC meeting was held in Cascina at the Virgo site 7th -8st of May 2013. The agenda of the meeting is attached to this report.

The STAC is very pleased with the overall progress of the advanced Virgo project that has been made in the time from the last STAC meeting. The STAC has got the impression that all the right monitoring and management tools are now in place. With these tools the status and challenges of the project have been analysed and we think that the project leadership is seeing a very similar picture of the overall project status as the STAC and is arriving at very similar conclusions. The STAC strongly encourages a continued effort to keep up with the goal of the timely completion of the project.

The STAC appreciates that most speakers respected the allotted time for their talk shown in the agenda very well, which eased covering the foreseen topics a lot and allowed some discussion and clarifying questions after each talk.

The STAC is pleased to hear that the mandate of the EGO director has been extended to the foreseen end of the advanced Virgo project. This decision ensures continuity in busy times when advanced Virgo approaches the peak time of construction and starts commissioning the first subsystems.

The STAC also takes note of the nomination of an EGO deputy director, which will certainly help in realizing the best outcome in the coming years.

The EGO director reported on the continued efforts for creating an ERIC and the approval of these efforts by the EGO Council. Beyond the financial benefits of VAT exemption, this gives an important political signal. Furthermore, it is quite advantageous for getting a high priority place in the horizon 2020 lists which eases potential future access to EU funds.

One such opportunity for EU funding has been realized with the GraWIToN Initial Training Network. Five out of the 13 Early Stage Researchers of the ITN will go to Italy and to be directly involved in advanced Virgo research. This success adds new manpower to the project, but it must be noted that it is inexperienced help and does by no means solve the manpower problems of the collaboration.

The STAC heard that Advanced Virgo has achieved the status of a CERN Recognized experiment. This can be regarded as a valuable political signal and it assures access to CERN expertise.

There is significant progress toward an EM follow-up MOU in discussion with the LSC. Contacts made to ESO for generating awareness of an additional multi-messenger player in astronomy is a good sign and important for the field of GWs.

The advanced Virgo spending profile suggests that the project has accumulated some delay. This impression may be amplified by the coarseness of the monitoring time steps. Contingency usage was about twice the rate which would maintain a constant fraction of the funds expended in the time between October 2012 and February 2013, and returned to the proportional rate in the last two months. The contingency spending was entirely dominated by the MIR reference optics costs. The STAC does not regard this as a source of worry as it is not a continuing burden.

The STAC has been asked to suggest names for new STAC members replacing Guido Zavattini and Christophe Salomon whose mandates are ending. We encourage the Council to consider the following scientists:

- Prof. Guglielmo Tino, European Laboratory for Nonlinear Spectroscopy at the University of Florence working on ultracold atoms and precision measurements
- François Nez, Research Director at CNRS, Group leader at Laboratoire Kastler Brossel, Paris France, working on precision metrology and fundamental constants.
- Christoph Westbrook, Laboratoire Charles Fabry de l'Institut d'Optique, (IOTA and CNRS) working on Bose-Einstein condensates of metastable helium
- Prof. Andrea Lommen, Franklin & Marshall College, working on pulsar timing and member of GWIC

Candidates with an experimental interferometric gravitational wave detection background:

- Prof. Kenneth Strain, deputy director of Institute for gravitational Research at Glasgow University, member of GEO collaboration
- Dr. Stefan Hild, lecturer at Glasgow University, member of GEO collaboration

The present STAC member Christophe de la Taille expressed the wish to retire from the STAC due to increased work load. He suggests to be replaced by his successor as Technical Director of IN2P3, Catherine Clerc. The STAC supports this proposal.

We note that for a long time the STAC had and still has only male members.

Roberto Battiston is offering to serve a second three year period and we recommend renewing his mandate for another term.

The preliminary plan for the date of the next STAC meeting is 29th and 30th of October 2013.

Data Analysis

CBC group issues

The STAC would like to thank both the Data Analysis Coordinator and the Compact Binary Coalescence (CBC) chair for their presentations.

The CBC chair presented the activities of the group in a very concise manner. Actually the CBC presentation was one of the best we had seen since several STAC meetings. We especially appreciated the emphasis on the physics and modeling of CBC sources, with all the details of the various methods implied in the definition of the templates, and discussion of the various DA methods.

Following a question raised in the last STAC report, the CBC chair described a way that tests of GR are performed using the inspiral (post-Newtonian) part of the signal. That method is quite general as it uses a number of arbitrary parameters in front of each terms of the template which are varied independently. However it requires a high signal-to-noise ratio, and an estimate of which S/N ratio would be needed to use the method with a given level of precision could have been added to the discussion. As mentioned in the last STAC report other tests of GR are possible, notably the test of the no-hair theorem with the ringdown part of the signal which concerns both the CBC and burst groups. These could be discussed at the next STAC meeting.

The CBC presentation discussed the very important case of NS coalescences and the effect of the internal structure of neutron stars. The internal structure affects only the last cycles of the inspiral signal just before the merger and it has been

computed numerically with great details. The STAC was surprised that recent numerical simulations of NS coalescences, showing that in some cases the two NS merge and form first a hypermassive NS (called HMNS) which finally collapses to a BH, were not taken into account. The HMNS forms when the two progenitor NS have a rather large mass, say above 1.8 solar masses. Recent observations from millisecond binary pulsars have shown the existence of such rather massive NS. Thus the formation of the HMNS is likely to occur for some CBC, and this could be detected from the GW signal.

Concerning spins the presentation did not say if the effect of the precession of the orbital plane due to the spins is taken into account (precessing binaries, whose spins are not aligned with the orbital angular momentum). The precession of the orbital plane can be computed numerically, but is also known analytically at linear order in the spins i.e. the so-called spin-orbit level.

The STAC would like to see a plan from different group leaders on how the groups intend to overlap their efforts for common sources.

Computing issues

The idea that each group now needs to write a research proposal, which is reviewed by an internal committee, in order to conduct a particular search demonstrates an extremely good level of organization. We also note the fact that the Bayesian searches have now been combined into one package and an effort is being made to ensure that this package is compatible with the two Virgo computing centers at Bologna and Lyon.

One or two things remain unclear to the STAC at this point. Regarding the research proposal, we would like clarification on the composition of the internal review board. Is this a Virgo only board, or Virgo-LSC? If it is the latter, what assurance is there that the goals of the Virgo project are respected and that the process is not LSC dominated? If a particular research proposal, such as a CW search which can be carried out with one detector, is in the interest of Virgo only, how is this handled?

It also remained unclear after the presentation of the CBC chair, and after the presentations in the past, just what exactly is the level of participation of the Virgo DA group between the two collaborations (Virgo-LSC) in terms of the search for sources. Maybe it is the case that it is impossible to make a distinction between the Virgo and LSC DA groups. If so, this needs to be made clear to the STAC. However, this also raises the question of what is the ability of the Virgo DA group to carry out a full analysis in the worst case scenario of the project finding itself isolated from the LSC (a case which should under all circumstances be avoided by careful MOU negotiations).

The STAC is unclear why the DA group has asked for twice the computing resources at Bologna this year. Is this due to an increase in usage of the

computing centres? If so, is this level of resources now needed for the foreseeable future and what are the effects on the total cost of the projected computing budget? The current direct financial impact amounts to about 1 full-time-equivalent staff member, so significant in the light of advanced Virgo staffing needs.

We also thank the Data Analysis Coordinator for the hard work that she has put into the creation of a computing model. While there has been significant progress since January of 2013 on the computing model, it is clear that there is still a lot of work to do. It was pointed out that the majority of the work is dependent on non-permanent people. The STAC believes that while the implementation of the computing model may be possible with the current number of people, its continuity is not. Our belief, which is shared by the EGO director, is that the number of people dedicated to computing is insufficient. The implementation and maintenance of the computing plan will become more and more important as we approach commissioning and data acquisition. A failure to boost personnel in this area could have consequences for the project in the future, especially if the non-permanent personnel are lost in the next few years.

The priority questions that the STAC believes answers are needed are:

1. For how long do data need to be stored on-site? Only reduced data sets will be transferred to the computing centres. The External Computing Committee suggested investigating the needs of a large data buffer on site for rapid data access in the light of ever increasing data transfer rates. The costs, speed and reliability of data transfer must be weighed against additional costs of data storage on site, including manpower required for maintenance. In case data transfer for the entire data set (6.2 TB/d) is found to be reliable, cheap and fast enough, the on-site data storage volume may be reduced to safely cover the longest expected data transfer breakdown to the computing centres. The project needs to make sure that data stored on tape are easily and quickly accessible.

2. What are the true storage costs both on-site and at the Computing Centres?

3. What are the real Virgo computing needs ? What is to be computed at the Computing Centres in Lyon and Bologna? Is it necessary to use common tools for both centres? Can support be obtained from the Computing Centres ? How does all this depend on the outcome of the MOU and on foreseen scenarios (e.g., will there always be a consensus on which data are worth analysing?)

4. There clearly needs to be an agreement with LSC computing groups. Is there a plan to include a paragraph in the LSC/Virgo MOU on resource sharing ?

5. How are the Computing Centres and EGO personnel acknowledged in terms of publications etc ?

6. What is the future of computing? GPUs vs. CPUs, GRID vs. CLOUD. Pursuing the reslution of each of these questions requires manpower in terms of hardware implementation and maintanance, which immediately leads to added cost. Are the resources available ? Will a choice now lead to problems in the future?

7. What are the similarities/differences between the Virgo and LSC computing models, structure etc ?

8. In a joint analysis with LIGO, how will it be determined where codes will be run ?

9. What are the current communication pathways between the Computing Centres, Virgo and EGO? An organigram should be included in the report to fully explain this.

10. How does the decision process work within the project? If a decision is made to use GPUs, who is ultimately responsible for proposing the idea, and who is responsible for agreeing to the move? How « democratic » is the decision making process in terms of the proposal, i.e., how many of the Virgo DA groups need to support an idea before it is proposed? Is there a veto process?

The STAC was made aware that there were certain difficulties in the preparation of the computing model. However, the STAC was even more surprised to hear of the existence of the Virgo Data Analysis Software (VDAS) subgroup. From what we understand, the role of this group is to tackle issues regarding software and computing, ease communication with the Data Analysis Software Working Group (DASWG) in the LSC, manage data transfer and access, manage the Virgo computing farm at Cascina and detail the computing needs of the various groups within Virgo. This group would seem to be the natural choice when it comes to the development of a computing model. While we understand that the VDAS group reports to the Data Analysis Coordinator, it is normally the role of the Data Analysis Coordinator to coordinate the scientific goals of the project, rather than the computing needs, as this requires a different type of expertise. The STAC feels that the attitude towards computing within the project has not evolved and is stuck in « non-project » mode without proper structure. To move forward we believe resolution of the following questions is needed:

1. Clarification on the role and position of the VDAS group and the DA group within the project.

2. If this group is indeed charged with the computing issues for the project, why is it not directly involved in the development of the computing model?

3. Is there the need for a division between coordination of the scientific goals and computing needs of the project? While one is clearly dependent on the other, they both require different types of expertise.

4. Is there sufficient transparency/communication between the Virgo and EGO computing groups? A case where one group possibly undermines the other is undesirable if the project is to be fully ready for Advanced Virgo data acquisition and analysis.

Regarding the development of the Advanced Virgo Computing Model, the STAC would like to highlight the effort by Manuel Delfino and the External Computing Committee. The External Computing Committee report was extremely clear and informative on the needs of the project and the necessitated renovation of the Virgo computing structure for the advanced detector age. The STAC recommends the continued use of highly skilled personnel evaluating the needs of the project. One particularly interesting proposal is that computing tools that have been developed at the LHC could be implemented in advanced Virgo. We also support the recommendation of the External Computing Committee chair that the communication pathway needs to be shortened, and an installation committee be formed. This committee, at working group level in contrast to directorate level, would directly represent Virgo, EGO, the Computing Centres in IN2P3 and CNAF, and through the computing centers would provide a communication pathway to the LHC. This would aid the flow of information and technology from the LHC to the Advanced Virgo project.

Manpower issues

The STAC would also like to reiterate a proposal made in the last report regarding manpower. It comes from the fact that we are made aware at each STAC meeting that there is not only a general lack of manpower in the project, but also that a number of critical areas, including DA and computing, are dependent on non-permanent people. The STAC thinks that there are certain actions that can be taken to retain expertise within the project, even if it is only on a non-permanent basis. In the last report, we recommended that the EGO/VESF fellowships be used solely to employ people that make a direct contribution to the project. However, we notice that some of the fellowships went to theoretical studies that have no direct use for the DA or computing groups. We would like to once again make the recommendation:

The destination of the EGO/VESF fellowships within the project should be re-evaluated. While at one point these fellowships allowed the employment of theoreticians in the field of GWs, the current manpower shortage within the project requires a change. For the foreseeable future, until a verified detection has been made, the Virgo project should provide fellowships only to personnel that make a direct contribution either to DA or computing, i.e., in the domain of data handling, the development and implementation of search algorithms, improvement and maintenance of data transfer and/or storage, maintenance and utilisation of advanced computing methods such as GPUs, GRID, CLOUD etc. The selection process and distribution of personnel should become the sole responsibility of the EGO director, the Virgo spokesperson and the current Data Analysis Coordinator, to ensure the proper allocation of resources.

The STAC recommends the preparation of a DA document for the next STAC meeting, containing detailed information on topics such as manpower distribution, critical areas where manpower may present a problem in the coming years, publications in the last year or in preparation, important developments in software or analysis methods, and a 12-month plan for each subgroup.

If the VDAS subgroup remains in existence, the STAC asks that the chair of the VDAS group present at the next STAC meeting in order to properly define the role and responsibilities of the group, its position within the project and its links to the other DA groups.

VESF

In the last STAC report we wrote:
In the last report the STAC recommended to use VESF positions for boosting the manpower situation in the DA section. The STAC appreciates that the fellowship decisions in VESF started moving into this direction, but is disappointed to see that still two of the fellowships have gone to theoretical research and strongly recommends to further pursue this goal in the next round. While the purpose of the VESF in the past was to coordinate the allocation of GW postdocs in the wider community outside of the Virgo project, especially regarding theoretical/astrophysical and numerical research, the STAC feels that for the time being, the mandate of the VESF should be changed. We are currently in a period of financial constraint and uncertainty for the project. Therefore, every effort must be made to ensure that the allocation of resources should be a direct advantage to the project. We would encourage the VESF to continue in the organization of summer schools, public outreach etc, which are vital to the future health of the community. However, we feel that the allocation of postdocs or students should become the direct responsibility of the EGO director, the Virgo spokesperson and the Data Analysis coordinator. In order to reflect what is being asked of the instrumental groups, we recommend that until a point is reached where it is felt that manpower needs have been answered and the project has sufficient funding to allocated positions to theoretical research, future postdoc/student positions must be directly implicated in the data analysis effort of the Virgo project. The hardware work is going forward, and sufficient energy also needs to be put into preparing the data analysis for the advanced era. It would be a shame to have put the effort into the experimental side and arrive in a position where DA cannot be done effectively when the instruments are ready.

The STAC recommends that the mandate of the VESF be adapted to the current situation in these respects.

We did not receive any feedback on this topic and would like to see a written response for the next STAC meeting.

The STAC also suggests reconsidering the decision of awarding one year fellowships instead of following the STAC recommendations to give two year fellowships to minimize learning and job-seeking ''overhead'' (though in the present cases we noted that the fellows have already obtained experience in the field which avoids long learning times).

We did not receive any feedback on this topic and would like to see a written response for the next STAC meeting.

Commissioning Plan

The STAC appreciates that a first commissioning plan has been devised and approves the fact that this is understood to be a living document which evolves in time along with the WBS, prototype tests, and the installation progress. We see that the process of developing the commissioning plan resulted in a much better understanding of the difficulties and the increased needs of communication. It also resulted in launching some pre-commissioning planning activities. The manpower census foreseen in the commissioning plan should be backed up (if not issued) by the Virgo spokesman to give it enough authority to receive timely responses.

Advanced Virgo Organizational Issues

The STAC would like to see a presentation by the new commissioning coordinator at the next STAC meeting to provide an overview of the commissioning effort.

The STAC appreciates the appointment of a quality officer. We have the impression that quality management is making good progress.

We note that the performance of some subsystems, e.g., auto alignment, the noise contribution of the OMC due to thermo-refractive noise, and the laser power stabilisation system may compromise the sensitivity that the new thermal noise model would allow.
Nevertheless the priority of the subsystem working groups should be put on reaching implementation readiness well in time and focusing on the frequencies of best sensitivity, at the possible expense of additional noise at very low (or high) frequencies while keeping the path of improving the noise performance at low frequencies open (whenever possible).

Manpower issues

The report of the collaboration spokesman included a summary of the available manpower arranged by subsystem. While this report gave a good overview of the available manpower sorted by subsystems and laboratories it did not give sufficient insights into the balance between availability and needs.
We would like to repeat our advice that it is essential that every head of group regularly, e.g., every three months, check whether the availability and performance of personnel and the overall progress are agreeing with the plans and if not adjusts the staffing situation by requesting more manpower from the collaboration or EGO.

We heard that the required engineering manpower has been underestimated and that there is a strong need of a flexible engineering group to assist the various subsystems. Design and construction speed could be increased by hiring a few additional engineers for the next 3 years.
The highest priority for advanced Virgo must be the timely installation and commissioning of the detector enabling the collaboration to participate in a joint data science run together with LIGO. While the STAC does not see fundamental technological problems, the shortage of manpower especially on the engineering side may develop into a serious problem. All possible options for an improvement should be considered in a joined action by the Virgo collaboration, EGO, and the EGO Council. Possible remedies could be:

- usage of some of the advanced Virgo contingency to install a short-term EGO based Project engineering group, consisting of an additional mechanical engineer, an electrical engineer and an optical engineer, which works on various topics depending on the demand of the subsystem working groups. The needs of the subsystem working groups may require some of these engineers to stay at remote laboratories for extended times.
- temporarily transfer people from the LIGO collaboration to Cascina. There are interested people and the STAC regards it as a great opportunity for both sides to exchange expertise and strengthen the cooperation. In many cases the expertise should match the requirements very well. The STAC recommends that a search be made for funding options for a scientist exchange program with LIGO.
- negotiate with the laboratories belonging to the collaboration to temporarily (i.e., for a duration of 3 years) provide additional engineering support.

The STAC recommends that the EGO Council approve the usage of contingency for temporarily increasing the engineering manpower and to support an exchange program with LIGO scientists. We would like to point out that also in advanced LIGO most of the contingency has been used to increase the manpower due to initial under-estimates of the need. This step is the most efficient if done early in the project with strongly diminished advantage towards the end of the project. The funding agencies have to be aware that this may imply a slight increase of the contingency towards the project end if needed.
Furthermore we encourage the whole collaboration to proactively fight for a temporal increase of overall manpower.
The STAC noted with some uneasiness that retaining sufficient expertise in all subsystems until project completion and the end of commissioning is regarded as a problem with a variety of reasons:

- for a lack of funding some expiring contracts cannot be extended
- due to the lack of permanent positions and rules, valuable experienced persons may not have their positions extended, or converted to long-term positions, and so must leave
- frequent natural fluctuations in an environment largely involving educational institutions combined with the lack of promising career paths makes it difficult to find and/or retain sufficiently qualified replacements for vacancies
- the level of payment on site is often regarded as unattractive

Effort should be made to address each of these difficulties to try to make progress on attracting and retaining staff.
The STAC believes that some manpower problems can be mitigated by allowing the EGO staff being members of the Virgo Collaboration, and through it recognizing the value of their work and keeping motivation up. Already now key personnel are leaving due to dissatisfaction. From the STAC perspective it is hard

to understand the apparent difference in treatment of EGO and other collaboration laboratories. The STAC therefore strongly encourages the Collaboration to reconsider their policy on the issue and recommends the EGO Council to discuss adequate actions.

Selected Subsystems

General remarks

In the last STAC report we wrote: The STAC appreciates the intention of collecting all available documentation in a single repository to maximise the availability for the collaboration. The STAC is not aware whether a person has been identified for making this documentation as accurate and complete as possible, as recommended in the last report.

The STAC understands that there is now a substantial core of documentation in the TDS for the advanced Virgo Project components and subsystems, and this has enabled resolution of technical and programmatic difficulties. The STAC would welcome some more information on this topic at the next meeting, in particular an assessment of documentation currently lacking.

The project office and the overall coordination throughout the project appears to be running very well, in some measure to the greater communication and the availability of information.

The recalculation of the thermal noise using up-to-date models shows a ‘fundamental’ low-frequency noise floor which is lower, and places more demands on the subsystem performance at low frequencies. A coherent approach to moving to a design which can realize the full performance of the PAY and SAT subsystems should be developed, and then the elements which are either easy to address or which will be difficult to retrofit later could be pursued. However, as noted elsewhere, if low-frequency work can be deferred in favour of early mid-band (~100 Hz) operation, that is a desirable trade.

Similarly, if the system can be focused (literally and figuratively) at low-laser-power operation, that will lead to near-term simplification and earlier first observing dates. We note that Advanced LIGO is also pursuing this approach of a staged implementation.

1. **MIR**

The STAC considers progress in the mirrors subsystem group as very satisfactory. The outcome of the call for tender for polishing the substrates, in which the ZYGO company offered ion beam figuring of the substrate surfaces including a compensation of refractive index inhomogeneities, is very positive. It was reported that polishing work is in progress now. Issues arising from refractive index inhomogeneities measurements being performed at ZYGO at 633 nm

instead of 1064 nm should quickly be followed up and solved. With the delivery of the first test mass foreseen at the end of November 2013 and the new wavelength shifting interferometer at LMA to be delivered in July 2013 a check of the refractive index inhomogeneities compensation at a wavelength of 1064 nm should be done as soon as possible. With many long lead time items involved great attention has to be paid to the overall schedule.

The coating results with the planetary drive are encouraging, and the detailed modelling indicates that the coatings presently in production for Advanced LIGO would be satisfactory for Advanced Virgo.

2. PSL

The current status of the pre-stabilised high power fibre laser system still being in the R&D phase is makes it unlikely that the program could deliver a reliable laser source at the end of this year. The STAC approves of the decision to use the Virgo+ laser for the first stage of the project. Priority should be put on bringing this laser system to a reliable and stable high power operation. The path towards a 200 W laser system can then be redefined for a longer development time scale. We encourage the subsystem group to a not entirely rely on commercial companies but seek communication and knowledge exchange with other research groups worldwide.

The sensing system for the laser power stabilisation might be marginal in performance with respect to an improved thermal noise model. The power to be detected on each photodiode seems high (of order 100mW) and we recommend some studies of whether this might cause excess (i.e., 1/f) noise. Since there is no out-of loop sensor foreseen, it should be assured that all four photodiode signals are accessible individually for the control system, such that a subset of them can be used as out-of-loop sensors for noise budgeting as required.

3. TCS

Good progress has been made with TCS. Investigate the role of remaining refractive index inhomogeneities after only input test mass inhomogeneities have been corrected by ion beam figuring. We recommend that a study of inhomogeneities of other transmitted optics be made for the central interferometer to determine if those can and should be corrected as well. Measurements of the optics and their response should be undertaken in a way where the masses are suspended similar to the final suspension. Is there adequately precise modelling for the way in which corrective coating will distort the substrates? Is there uncertainty that corrective coating could do more harm than good? With the overall perspective of a lower-power start of observing, the team may consider polishing the recycling mirror to a curvature at or closer to zero-power radius-of-curvature.

4. OMC

The analysis of the monolithic AdV Output Mode Cleaners (OMC) revealed a problem with thermo-refractive noise. Although this may at some point in time limit the sensitivity of advanced Virgo, we do not recommend to entirely revising this subsystem, but rather put the priority on constructing an operating OMC system (consisting of two mode cleaners of the revised type) in a timely fashion.

Once this has been completed, the task of designing and constructing an OMC with improved noise performance may be addressed.

5. SLC

The team recognizes the complexity of this task and hopes to engage an optical engineer to help in the engineering. The modeling for the design seems firmly in place.

6. PAY

The payload construction, assembly, and testing is making good progress. Many different payloads and the monolithic suspensions are included in this crucial subsystem.

Testing the monolithic suspension.

Concerning the mechanical losses of the mirrors and last suspension stage it is a very positive evolution that the Q measurements done in the lab confirm in situ measurements. This enables reliable testing in the labs before attaching the payload to the super attenuator. It appears to the STAC that the time is right to move forward to more definitive and 'final' configurations in the Q measurement work, even if there are some costs associated with masses and the fabrication of multiple test assemblies.

The STAC appreciates the work being put into the testing of the new monolithic suspension system and is looking forward to the report on results expected at the next STAC meeting. **This key element of the instrument merits increased manpower to ensure a timely and confident delivery.**

7. SAT

The super attenuators subsystem group reported the loss of essential positions through ending and not renewed contracts. It has to be brought to the attention of the collaboration that these positions are absolutely critical for the success of the experiment. The SAT system is on the main critical path. Hence the collaboration should immediately start negotiations with the relevant institutions to ensure continuity of manpower and expertise.
The STAC recommends considering compensating delays which have accumulated in SAT in the recent past by accelerating progress by working two shifts per day if sufficient manpower is available.

STAC AGENDA

7 – 8 May 2013, EGO site, Cascina

Tuesday May 7th *in the EGO Seminar room (central building)*

9:00 - 9:15 STAC closed session: finalization of the agenda

9:15 – 10:50 STAC open session

9:15 – 9:40 EGO report (F. Ferrini)

9:40 – 10:10 Virgo Collaboration report (J.-Y. Vinet)

10:10 - 10:45 Report from the Data Analysis Coordinator (P.Astone)

Coffee break foreseen during the time interval 10:45-11:00

11:00 - 13:00 ***Restricted Session*** *(meeting room)* on the Computing Model and Plan in presence of M. Delfino P.Astone A.Bozzi G.Losurdo J.-Y.Vinet F.Ferrini)

13:00 – 14:00 Lunch

14:00 – 18:00 STAC open session

14:00 – 14:30 Report from the CBC Chair (C. Van Den Broeck)

14:30 – 15:00 Advanced Virgo Project overview (G. Losurdo)

15:00 – 15:30 AdV planning, quality management,... (H. Heitmann)

15.30 – 18:00 Selected Sub-Systems Reports:

Thermorefractive noise in the OMC

Optics

The Payload

Coffee break foreseen at ~ 16:00

18:00 – 18:30 Staffing at the present time, and for the commissioning effort

19:30 STAC Dinner

Wednesday May 8th

09:00 – 16:00 STAC closed session *in the EGO meeting room (central building)*