

**Attachment Number 3 to the
Memorandum of Understanding (LIGO-M970123-00-M)**

between

Virgo

and the

Laser Interferometer Gravitational Wave Observatory (LIGO) Project

June 1, 1999

This Attachment No.3 (agreement) to the Memorandum of Understanding (MOU) LIGO-M970123-00-M between the Virgo and LIGO Projects covers collaboration and sharing of respective expertise in the area of simulation tools and data analysis. The period of performance for the activities in this agreement is from June 1, 1999 to May 31, 2000. This period may be modified by an agreement to a revision of this Attachment No. 3.

1. This document is an agreement between the Virgo Project (Virgo) and LIGO Laboratory (LIGO). It defines the program of collaborative work by Virgo and LIGO in the areas of computing, detector diagnostics, data analysis and simulation, prior to the commissioning of the Virgo Central Interferometer and to the initial LIGO data taking.

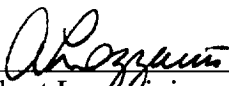
The research described in paragraphs below will be under the direction of Benoit Mours and Albert Lazzarini for Virgo and LIGO, respectively

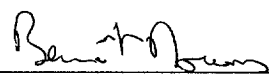
2. The long term objectives for this work are for Virgo and LIGO to take full advantage of the experience and developments of the other group, to develop joint solutions where appropriate, and to insure commonality where desired. The scientific motivation is to work toward practical and optimized methods for doing coincidences between Virgo and LIGO, while maintaining scientific independence as determined by each group. The second objective is to develop detector diagnostic and analysis software and simulation tools by both groups that can be used on both Virgo and LIGO data, which will allow checks and validation of the software and of scientific results.
3. Computing hardware requirements and plans will be studied with the goal of optimizing the use of the finite resources of each group.
4. Networking requirements between Virgo and LIGO will be defined and a plan or proposal developed for obtaining the necessary bandwidth and reliability.
5. Some common simulation software may be developed, but each group plans to develop their own overall simulation system. Through this collaborative work Virgo and LIGO will investigate ways to cross check and validate each group's simulation programs through comparisons

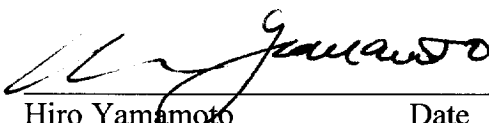
with results using the other group's programs.

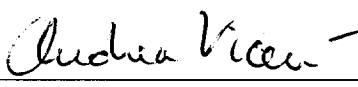
6. The data analysis systems will be developed to the extent practical such that the LIGO system can be used to analyze Virgo data and vice versa. Between Virgo and LIGO, a protocol will be developed for the exchange of data, as well as the detailed scheme for making coincidences.
7. To implement the above, detailed collaborative work between data analysis scientists will be of great value. This will give the necessary experience with the simulation tools and data analysis of the other group that will be important when coincidences are undertaken. Both Virgo and LIGO will enable this through visitors and exchanges.

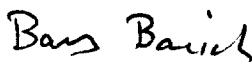
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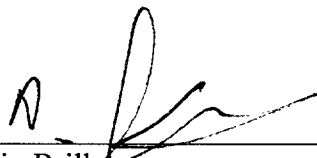
 8 June 1999
Date
Albert Lazzarini
LIGO Data & Computing
Group Leader

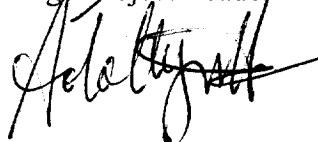
 6/24/99
Date
Benoit Mours
Data Analysis Group Leader for
Annecy and Virgo

 6/24/99
Date
Hiro Yamamoto
LIGO Task Leader for Modeling

 6/24/99
Date
Andrea Vicerè
Data Analysis Group Leader
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Barry Barish
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