

Attachment DAT to the
Memorandum of Understanding (LIGO-M 050233 -00-M)
between the
Balearic Islands University Relativity Group (UIBGR)
and the
Laser Interferometer Gravitational Wave Observatory (LIGO)
August 15, 2006

This Attachment DAT to the Memorandum of Understanding LIGO-M 050233 -00-M defines the role of the **Balearic Islands University Relativity Group** as a Member of the LIGO Scientific Collaboration (LSC), in particular, its activities in data analysis in support of the initial LIGO interferometers. The period of performance for the activities in this Attachment is from August 15, 2006 to August 15, 2007.

1. Together, the LIGO Laboratory and the LIGO Scientific Collaboration (LSC) are responsible for implementing and exploiting the initial LIGO detector through its science data runs. The LSC has organized the data analysis effort into search groups which coordinate the analyses, perform detailed reviews, and prepare publications on behalf of the collaboration. LSC groups are encouraged to participate in one or more of these groups. MOU Attachments define the contributions of each participating group to the data analysis groups.
2. During the period August 15, 2006 to August 15, 2007, the members of **UIBGR** will participate in the analysis of initial LIGO data in the following areas:

a) Binary Inspirals

Not Applicable

b) Bursts

Not Applicable

c) Stochastic

Not Applicable

d) Continuous

In this period we plan to finish the analysis of S4 data using the weighted Hough transform and publish the results in the paper "All-Sky LIGO Search for Periodic Gravitational Waves in the S4 Data Run" LIGO-P060010-01-Z (2006), together with the other incoherent methods. The targeted journal is Phys. Rev. D.

We also plan to study possible different hierarchical schemes for carrying out large parameter space pulsar searches. Together with the AEI there is an ongoing development of a hierarchical pipeline that combines coherent and semi-coherent searches. The developing software can be found under `lalapps` and it is currently being optimized. Our aim is to apply a simple 2-stage hierarchical search on S5 data. The first stage consists of the Hough algorithm applied to different stacks of Fstatistic vectors (for a single or multiple interferometers) for every value of spindown and sky-location. The second stage follows up the best candidates from the first step by performing a longer coherent integration. We will investigate the feasibility of implementing this new search under `Einstein@home`. With the help of the CW analysis group, the first hierarchical search will be performed during the next year, while we keep developing further strategies, as χ^2 vetoes, to reduce the false alarm in the Hough candidate selection procedure, and therefore improve the efficiency of the whole search.

Our aim is also to compare our approaches to those implemented by the Virgo group and understand what schemes works best for which signals.

e) Other Contributions

Not Applicable

3. Resource Sharing: The LIGO Laboratory will contribute resources including allocation of appropriate scientific and engineering personnel, research facilities and funding in support of the effort in Item No. 2, as indicated below.
 - a) Research accommodations for **UIBGR** group members while on LIGO research assignment at any LIGO Laboratory site,
 - b) Access to LIGO data through established LSC channels in support of this work.
 - c) Not Applicable

4. Coordination and Reporting -

UIBGR will perform this research within the structures established by the LIGO Laboratory and the LSC where appropriate. In particular activities described in Item 2a) will be carried out within the LSC Inspiral Search Group, Item 2b) will be carried out within the LSC Burst Search Group, Item 2c) will be carried out within the LSC Stochastic Search Group and Item 2d) will be carried out within the LSC Continuous Waves search Group. This includes keeping the Group leaders informed of activities and plans, reporting to the group at meetings and telecons, and through technical documents submitted to the LIGO Document Control Center.

In addition, an annual report will be submitted with the update to this Attachment, giving a summary status on research by topic as indicated in Item No. 2, including progress against the milestones if any, significant accomplishments such as new insights/discoveries or publications, issues of concern if any, and an indication of invested time. This Attachment will be updated at least annually with a plan of activities for the succeeding on-year period. These documents will be due one month before the close of the period of performance under this Attachment.

5. All computer code delivered to the LSC under this Attachment must be developed in consultation with the LSC Data Analysis Software Working Group (DASWG) and archived, documented and reviewed as determined by that group.

Approved:



Jay Marx

LIGO Laboratory Director

Alicia M Sintes

Principal Investigator

Balearic Islands University Relativity Group



Peter Saulson

LSC Spokesperson

