



**Attachment DAT to the
Memorandum of Understanding LIGO-M050233-00
between the Balearic Islands Relativity and Gravitation Group
(UIBRG)
and the
Laser Interferometer Gravitational Wave Observatory (LIGO)
For The Period
August 15, 2007 - August 14, 2008**

This Attachment DAT to the Memorandum of Understanding LIGO-M050233-00 defines the role of the Balearic Islands Relativity and Gravitation Group (UIBRG) as a Member of the LIGO Scientific Collaboration (LSC). In particular, it addresses data analysis activities in support of the initial LIGO interferometers. The period of performance for the activities in this Attachment is from August 15, 2007 - August 14, 2008.

1. Collaboration

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 analysis, review, and publication on behalf of the collaboration. LSC groups are encouraged to participate in one or more of these groups.

MOU Attachment DAT defines the contributions of each participating group to the data analysis development groups.

2. Participation

During the period August 15, 2007 - August 14, 2008, the members of UIBRG will participate in the analysis of initial LIGO data in the following areas:

a. Binary Inspirals

We will continue working in collaboration with AEI and numerical relativity groups to integrate the knowledge on black hole merger waveforms from numerical relativity to construct "hybrid" and phenomenological waveforms. We plan to investigate the robustness and consistency of the matching procedure, and also study the parameter space metric for these waveforms, which is a crucial ingredient in constructing a template bank.

b. Bursts

Not Applicable

c. Stochastic

Not Applicable

d. Continuous

In this period we plan to finish and publish 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.

In collaboration with AEI and the pulsar group, we will study possible different hierarchical schemes, optimizations to the pipeline and parameter tuning, for carrying out large parameter space pulsar searches, depending on the computational resources. Over the last years, we have developed the software for carrying out such analysis that combine F-statistics coherent search and the Hough transform. The first hierarchical search is already analyzing S5 data by means of Einstein@home, but deeper searches, in selected areas of the sky (frequencies or spin-down parameters), could even take place using the LSC-clusters.

If the pulsar working group considers interesting, We will propose to use the incoherent Multi-IFO Hough search on the S5-SFT data, implemented similarly as it was done for S4, as a fast scan through the data and as a complement to Power-Flux.

we will keep investigating further strategies, such as chi2 vetoes, to reduce the false alarm in the Hough candidate selection procedure.

We will be involved with the Einstein@home development team. At present, we are putting lots of efforts in debugging the current application, to make it more robust to client errors and cross platforms issues.

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 UIBRG group members while on LIGO research assignment at any LIGO Laboratory site.

Not Applicable

b. Access to LIGO data through established LSC channels in support of this work.

Not Applicable

4. Coordination and Reporting

UIBRG will perform research within the structures established by the LIGO Laboratory and the LSC where appropriate.

In particular, with reference to activities described above:

2a will be carried out within the LSC Inspiral Search Group.

2b will be carried out within the LSC Burst Search Group.

2c will be carried out within the LSC Stochastic Search Group.

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 one-year period. These documents will be due one month before the close of the period of performance under this Attachment.

5. Computer Code

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.



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