Attachment DAT to the Memorandum of Understanding LIGO-M050348-00 between the Goddard Gravitational Wave Astrophysics Group (GGWAG) and the Laser Interferometer Gravitational Wave Observatory (LIGO)

For The Period

August 15, 2008 - August 14, 2009

This Attachment DAT to the Memorandum of Understanding LIGO-M050348-00 defines the role of the Goddard Gravitational Wave Astrophysics Group (GGWAG) as a Member of the LIGO Scientific Collaboration (LSC). In particular, it addresses data analysis activitites in support of the initial LIGO interferometers. The period of performance for the activities in this Attachment is from August 15, 2008 - August 14, 2009.

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, 2008 - August 14, 2009, the members of GGWAG will participate in the analysis of initial LIGO data in the following areas:

a. Binary Inspirals

Sean McWilliams will work on creating parameterized waveform models, tuned to numerical results, for LIGO data analysis applications.

b. Bursts

Alex Stroeer and Jordan Camp will continue the development of the Hilbert-Huang Transform (HHT) based pipeline to search for short (less than 100msec) Burst signals, with an emphasis on frequency-modulated signals, in particular the BH

binary merger. We will exercise the pipeline with S5 data, in preparation for the important upcoming S6 run which we will fully participate in.
Application of the HHT pipeline to S5 and S6 data will provide us with a large set of triggers, most of which will be glitches. John Cannizzo and Jordan Camp will use the high time-frequency resolution of the HHT to investigate the noise mechanisms behind the glitches. We will also follow up on interesting glitches identified by other pipelines, in consultation with the Burst group chairs.
Finally, John Cannizzo, Alex Stroeer, and Jordan Camp will pursue adaptive noise stationarity studies with application to external trigger searches (in collaboration with Szabi Marka.)

c. Stochastic

Not Applicable

d. Continuous

Not Applicable

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 GGWAG 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

GGWAG 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.

Jay Marx
LIGO Laboratory Director

Jordan Camp
Principal Investigator(s)
GGWAG

David Reitze
LSC Spokesperson

Attachment OPS to the Memorandum of Understanding LIGO-M050348-00 between the Goddard Gravitational Wave Astrophysics Group (GGWAG) and the Laser Interferometer Gravitational Wave Observatory (LIGO)

For The Period August 15, 2008 - August 14, 2009

This Attachment OPS to the Memorandum of Understanding LIGO-M050348-00 defines the role of the Goddard Gravitational Wave Astrophysics Group (GGWAG) as a Member of the LIGO Scientific Collaboration (LSC) in the areas of detector commissioning, detector characterization, and operations support in the initial LIGO interferometers. The period of performance for the activities in this Attachment is from August 15, 2008 - August 14, 2009.

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. LSC groups are encouraged to contribute to the commissioning, characterization, and operation of the LIGO detectors, as members of working groups established by the LIGO Laboratory and the LSC.

2. Participation

During the period August 15, 2008 - August 14, 2009, the members of GGWAG will participate in the initial LIGO detector research program in the following areas:

a. Detector Commissioning

Not Applicable

b. Detector Characterization

Jordan Camp, John Cannizzo and Kenji Numata will continue their collaboration with Robert Schofield on the investigation of environmental noise mechanisms in LIGO. Schofield now has a GUI of the HHT software which will allow for us to work efficiently together to study non-linear, transient noise couplings. We will use the HHT GUI for commissioning studies as well as noise characterization during S6.

Jordan Camp and John Cannizzo also plan to investigate detector noise stationarity. The HHT provides an adaptive decomposition of the time-series data which is well suited to tracking the noise stationarity. This information will be done in

collaboration with Robert Schofield and will made available to the detector commissioning scientists.

c. Detector Operations

Not Applicable

d. 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 GGWAG 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

GGWAG 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 in coordination with the LIGO Laboratory Commissioning Leader.

2b will be carried out within the Detector Characterization Working Group of the LSC.

2c will be carried out in coordination with the LHO or LLO Site Head.

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.

Jay Marx
LIGO Laboratory Director

Jordan Camp
Principal Investigator(s)
GGWAG

David Reitze
LSC Spokesperson

Attachment Z to the Memorandum of Understanding LIGO-M050348-00 between the Goddard Gravitational Wave Astrophysics Group (GGWAG) and the Laser Interferometer Gravitational Wave Observatory (LIGO)

For The Period

August 15, 2008 - August 14, 2009

This Attachment Z to the Memorandum of Understanding LIGO-M050348-00 lists the members of Goddard Gravitational Wave Astrophysics Group (GGWAG) participating in LIGO Scientific Collaboration (LSC) development group activitites in support of the initial LIGO interferometers. The period of performance for these activities is from August 15, 2008 - August 14, 2009.

Faculty:

The Faculty category includes all "faculty rank" LSC members. This includes professorial appointments, research faculty appointments, teaching faculty appointments, lecturer and reader appointments, and similar appointments, and visiting appointments in all these categories.

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Technical Staff:

The Technical Staff category includes all non-PI LSC members with scientist, engineer, computer systems administrator or programmer, technician, and similar appointments, and visiting appointments in all these categories.

Postdoctoral Scholars:

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Graduate Students:

Undergraduate Students:

Administrative Staff:

The Administrative Staff category allows the listing of administrative aides and other staff members who perform essential support services in or for LSC member groups, but are not involved in the LIGO Scientific Collaborations engineering or scientific work. *Personnel who are involved in the LSC's scientific or engineering work, including computer system administration and programming, should be listed under other categories.* Personnel listed as Administrative Staff may be designated as a point of contact or proxy, but do not appear as authors on LSC publications, do not count toward a group's council delegate allocation, may not serve as council delegates, and do not increase a group's shift obligation.

FTE Commitment:

#	Name	Category	Member	Research	LIGO
1	Camp, Jordan	faculty	100%	33%	50%
2	Cannizzo, John	faculty	100%	50%	50%
3	Numata, Kenji	faculty	100%	50%	50%
4	Stroeer, Alexander	postdoc	100%	100%	80%
				Total FTE:	2.30

Roles:

Principal Investigators: Camp, Jordan

Membership Point-Of-Contact: Camp, Jordan
Group PIO/Press Coordinator:
Proxies:

Author Eligible	Council Delegates
Camp, Jordan	Camp, Jordan
Cannizzo, John	
Numata, Kenji	

Approvals:

Jay Marx
LIGO Laboratory Director

Jordan Camp
Principal Investigator(s)
GGWAG

David Reitze
LSC Spokesperson