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**Attachment OPS to the
Memorandum of Understanding LIGO-M050377-00
between the University of Wisconsin at Milwaukee (UWM)
and the
Laser Interferometer Gravitational Wave Observatory (LIGO)
For The Period
August 15, 2009 - August 14, 2010**

This Attachment OPS to the Memorandum of Understanding LIGO-M050377-00 defines the role of the University of Wisconsin at Milwaukee (UWM) 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, 2009 - August 14, 2010.

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, 2009 - August 14, 2010, the members of UWM will participate in the initial LIGO detector research program in the following areas:

- a. Detector Commissioning

1. Detector Characterization

- (a) Assessment of Environmental Coupling: Fotopoulos will continue to support the coherence calculator, pycoh, which is being used to identify cross-correlations between detector readout channels and common linear couplings of the environmental channels with the gravitational wave readout channels.
- (b) Time Domain Calibration: Siemens and Burguet-Castell will continue to work on the production of $h(t)$ data for S6 analyses. The UWM group will continue to participate in work to deliver $h(t)$ with low-latency for online analysis in S6, as well as the creation of $h(t)$ using the RDS system. In addition the group will explore lower latency calibration procedures for Advanced LIGO.
- (c) Calibration Team: Siemens will continue to co-chair the Calibration Team.

b. Detector Characterization

Not Applicable

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 UWM 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

UWM 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.

Signature Pending Approval

Jay Marx
LIGO Laboratory Director

A handwritten signature in black ink, appearing to read "Patrick R Brady". The signature is written in a cursive style with a large, stylized initial "P".

Patrick R Brady
Principal Investigator(s)
UWM

Signature Pending Approval

David Reitze
LSC Spokesperson