

Attachment OPS to the
Memorandum of Understanding (LIGO-M050421-00-M)
between the
Department of Chemistry and Physics at Southeastern Louisiana University (DCP/SLU))
and the
Laser Interferometer Gravitational Wave Observatory (LIGO)
August 15, 2005

This Attachment OPS to the Memorandum of Understanding LIGO-M050421-00-M defines the role of the Department of Chemistry and Physics at Southeastern Louisiana University (DCP/SLU) as a Member of the LIGO Scientific Collaboration (LSC) in the areas of detector commissioning, detector characterization, and operations in support of the initial LIGO interferometers. The period of performance for the activities in this Attachment is from August 15, 2005 to August 15, 2006.

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. 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. During the period August 15, 2005 to August 15, 2006, the members of DCP/SLU Group will participate in the initial LIGO detector research program in the following areas:
 - a) *Commissioning* – In close collaboration with the LIGO LAB numerical simulation group, will continue development of e2e modeling of the LIGO I suspension with dynamics associated with the suspension wires' violin mode, optic's side, bounce and roll modes into consideration. As an extension of this activity, will support LIGO LAB numerical simulation group in developing e2e model of Advanced LIGO, focusing on mechanical modeling. The development will start with integration of existing seismic isolation models into e2e modeling, followed by parameterization and modification of e2e modeling of triple/quadruple suspensions, and modeling of more detailed mechanical effects such as locations of each suspension on HAM/BSC table.
 - b) *Detector Characterization* – Will continue e2e modeling of LIGO I Input Optic's (IO) dynamics. Development of mechanical modeling of IO (Mode Cleaner and Mode Matching Telescope) will be completed and results will be integrated to the e2e model of the other LIGO I subsystems developed by the LIGO LAB numerical simulation group. Will continue numerical analysis of LIGO I detector. Focus will be on understanding of the effect of IO's beam pointing fluctuation on the interferometer's performance.

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 DCP/SLU 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.
4. Coordination and Reporting – DCP/SLU Group will perform this research within the structures established by the LIGO Laboratory and the LSC where appropriate. In particular activities described in Item 2a) and 2b) will be carried out in coordination with the LIGO Laboratory Commissioning Leader. Coordination will include 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:

Barry Barish
LIGO Laboratory Director

Sanichiro Yoshida
DCP/SLU Principal Investigator

Peter Saulson
LSC Spokesperson

Peter Fritschel
LIGO Lab Commissioning Leader