

Attachment Number D to the
Memorandum of Understanding (LIGO-M960071-00-M)
between the
University of Florida Laser Interferometric Gravitational Wave Group
(UFLIGO)
and the
Laser Interferometer Gravitational Wave Observatory (LIGO) Laboratory
August 15, 1999

This Attachment to the Memorandum of Understanding LIGO-M960071-00-M covers the role of the University of Florida Laser Interferometric Gravitational Wave Group (UFLIGO) as a Charter Member of the LIGO Scientific Collaboration (LSC) and a member of the Advanced Detector Configurations Development Group (ADCDG). The period of performance for the activities in this Attachment is from August 15, 1999 to February 15, 2000. This period may be modified by agreement to a revision of this Attachment.

1. LIGO Scientific Collaboration - The LIGO Scientific Collaboration is organized as a separate organization from the LIGO Laboratory. It includes scientists from the LIGO Laboratory, and those from collaborating institutions, and has its own leadership and governance. The Collaboration will ensure equal scientific opportunity for individual participants and institutions. It will organize the research, publications, and all other scientific activities. The Collaboration will report to the Laboratory Directorate for final approval of its research program, technical work, observational physics publications, and talks announcing new observations and physics results. This will be done through regular reports to the Directorate and its PAC.
2. Charter Membership - An initial period for formation of the Charter group of institutions in the LIGO Scientific Collaboration commenced on March 1, 1997 and ended following the first full meeting of the Collaboration at which the Collaboration Council assumed its role.

Following the charter period proposals will be evaluated through the Collaboration Council. With Collaboration approval, an MOU with the LIGO Laboratory, including Attachments defining specific work, will be required for any participating institutions.

3. This document is an agreement between the University of Florida Laser Interferometric Gravitational Wave Group (UFLIGO) and the LIGO Laboratory concerning the activities of UFLIGO as a Collaborating Institution in the LIGO Scientific Collaboration (LSC) and the Advanced Detector Configurations Development Group (ADCDG). Specific research to be undertaken in support of LIGO is as indicated in item No. 8. below.
4. Advanced Detector Configurations Development Group - The Advanced Detector Configura-

tions Development Group (ADCDG) is the scientific collaboration for defining and developing entirely new advanced interferometers. It is expected that this development group will pursue research in dual recycling, resonant sideband extraction, Sagnac interferometers, systems with non-transmitting optics and other advanced configurations. A specific Attachment will define the roles and responsibilities of groups in this development group. Members of this group will normally be authors on publications reporting the work of the group and will normally be eligible to participate in data runs and science beyond the LIGO I data run.

5. Report of Progress - UFLIGO will provide a status report on its activities in support of LIGO every six months. The report will consist of: a) a summary status on research by topic as indicated item No.8 below 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, b) updated List of Collaborators, and c) a plan of activities for the succeeding six-monthly period. The report will be due one month before the close of the period of performance under the Attachment in question.
6. Term of Membership - The Membership will be renewed every six months upon evidence of satisfactory performance of agreed upon duties.

The coordinates of UFLIGO members are included in the Attachment Z to the Memorandum of Understanding LIGO-M960071-00-M.

7. Intellectual Property Rights - The rights to intellectual property developed under this Attachment will be subject to the National Science Foundation Grant Policy as indicated in Section 730, Intellectual Property.
8. During the period August 15, 1999 to February 15, 2000, the UFLIGO will participate in ADCDG activities as follows:
 - a) AIC Experiments: The planning for the prototype AIC experiments will continue. The results will be incorporated into the proposal to NSF, to be submitted in October, 99.
 - b) Error Signals: In the tabletop experiment the error signals will be improved and feedback loops finished. Efforts will be made to lock the entire dual recycled interferometer during this period and examine its behavior.
 - c) Interferometer Tuning: Preliminary results suggest that the noise floor in the lab is low enough to tune the interferometer to its working point and to measure the linear coupling between the different error signals and degree of freedom. This should allow the possibility of tuning the signal recycling (SR) cavity using two dependent offsets added to the appropriate error signals. As a first step, an attempt will be made to lock the detuned SR-cavity with these efforts. The next step will be to decouple the error signals in a detuned SR-Interferometer using the phase shifters.
 - d) System Locking: An attempt will be made to lock the system without any advanced lock acquisition system. This opens possibility to move mirrors, observe the signals, and look

experimentally for possibilities for lock acquisition. This can be compared with the current models and is expected to be very helpful in designing an advance acquisition system for suspended interferometers.

9. During the period August 15, 1999 to February 15, 2000, the LIGO Laboratory will coordinate exchanges of data and information as indicated in item No. 8 above, and as agreed.
10. The research effort pursuant to this Attachment D will be coordinated by Guenakh Mitselmakher and Syd Meshkov on behalf of UFLIGO and LIGO Laboratory respectively.
11. 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. 8, as indicated below. These resources will be in addition to the coordination effort and data to be made available per Item No. 9 above.
 - a) LIGO research effort at the University of Florida is supported in part with the LIGO Laboratory funds under the Caltech Purchase Order for IOO design and fabrication and detector integration and operations.

Approved:

Barry Barish

Barry Barish
LIGO Laboratory Director

G. Mitselmakher

Guenakh Mitselmakher
UFLIGO Principal Investigator

Jan 10, 2000

Date

Jan 15, 2000

Date