

**Attachment Number 1 to the
Memorandum of Understanding (LIGO-M970009-00-M)
between the
TAMA Project, Japan
and the
Laser Interferometer Gravitational Wave Observatory (LIGO) Project
March 15, 1997**

This Attachment to the Memorandum of Understanding LIGO-L970009-00-M describes a cooperative research effort between the TAMA Project, Japan and the Laser Interferometer Gravitational-Wave Observatory (LIGO) Project to investigate the validity of the LIGO locking model, using the TAMA 20 m prototype with varying configurations. The period of performance for the activities in this Attachment is from March 15, 1997 to March 14, 1998. This period may be modified by agreement to a revision of this Attachment.

1. The goal of this work is to investigate the behavior of the LIGO locking system. LIGO will provide the locking model and TAMA will provide the matrix diagonalization technique.
2. This task will be led by Masatake Ohashi for TAMA and Lisa Sievers for LIGO.
3. Work Plan- The tasks to be carried out and the methods for so doing are:
 - a. LIGO and TAMA will establish the locking system and procedure, which is a matrix diagonalization version of the LIGO locking system. TAMA will provide the results, which will be used for validation of this model.
 - b. In order to do this, a member of the TAMA Project will visit Caltech for approximately one month. During this visit, he will learn the LIGO locking model, and establish an appropriate system for the 20 m prototype in collaboration with Lisa Sievers. In turn, Nergis Mavalvala (LIGO) will visit Japan and work on the 20 m for approximately one month.
 - c. The results of this investigation on the 20 m prototype will be published in one or more papers whose authors will include TAMA representatives and the LIGO personnel, Lisa sievers and Nergis Mavalvala.
4. Technical, Schedule and Cost Reporting - The status of the work will be reviewed in a monthly teleconference involving all interested parties from TAMA and LIGO. The emphasis of these meetings will be on technical and schedule issues.
5. Cost - Each group will be responsible for the salaries and travel expenses of its staff partici-

pating in this effort. Reciprocal Exchange visits are also expected. The main experimental work will take place at TAMA.

6. 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 750, Intangible Property. This applies only to intellectual property developed at an NSF funded facility by personnel who are funded by NSF. It does not apply to intellectual property developed at TAMA by personnel who are funded by TAMA.

Approved:

Barry Barish

Barry Barish
LIGO Principal Investigator

Yoshihide Kozai

Yoshihide Kozai
TAMA Principal Investigator

3/27/97

Date

3/31/97

Date