

**Attachment OPT to the
Memorandum of Understanding (LIGO-M970077-00-M)
between the
German/British Collaboration (GEO 600) for the
Detection of Gravitational Waves
and the
Laser Interferometer Gravitational Wave Observatory (LIGO)
August 15, 2005**

This Attachment OPT to the Memorandum of Understanding LIGO-M970077-00-M defines the role of the German/British Collaboration (GEO 600) as a Member of the LIGO Scientific Collaboration (LSC) and a member of the Optics Development Group (ODG). The period of performance for the activities in this Attachment is from August 15, 2005 to August 15, 2006.

1. Optics Development Group – The Optics Development Group (ODG) is the scientific collaboration for defining and developing improvements in optics for use in advanced subsystems for the initial LIGO interferometers or in entirely new advanced interferometers. MOU Attachments define the roles and responsibilities of groups in this development group.
2. During the period August 15, 2005 to August 15, 2006, the members of the GEO 600 Group will participate in ODG in the following areas:

Coating Losses for Advanced LIGO and beyond

(i) Continuation of investigation of mechanical losses associated with adding dielectric coatings to mirror substrates, in collaboration with other LSC groups - Stanford University, Syracuse University, MIT, and Hobart and William Smith Colleges. Reduction of the mechanical loss associated with the addition of coatings to substrates and associated thermal noise remains an important research area for Advanced LIGO and is vital for the success of any future detectors that aim to have sensitivities better than Advanced LIGO.

We thus propose to continue to work with our LSC colleagues on studies of the excess mechanical losses associated with adding dielectric coatings to test mass substrates.

(ii) In collaboration with colleagues in Hanover and Jena we will proceed with work on measuring the mechanical loss of thin fused silica substrates before and after the addition of etched diffraction gratings in order to study any effects of the etching on mechanical dissipation

(Cumming, Heptonstall, Crooks, Rowan, Hough).

The research effort pursuant to this Attachment will be coordinated by Sheila Rowan (GEO600 Group) and the leader(s) of the ODG

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 GEO 600 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 – GEO 600 Group will perform this research within the structures established by the LIGO Laboratory and the LSC where appropriate. In particular activities described in Item 2 will be carried out within the Optics Development Working Group of the LSC. 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.

Approved:



Jay Marx
LIGO Laboratory Director

Benno Willke
GEO 600 Principal Investigator



Peter Saulson
LSC Spokesperson

David Reitze
ODG Leader