

LSC Six-Month Progress Report

Organization Caltech Experimental Gravitational-Physics Group (CEGG)

Report Date 08/15/1999

Attachment A - LIGO I

Item - Task 9 - NA

Not Applicable in this case.

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Attachment B - Isolation/Suspension/Thermal Noise

Item - Task 8 - NA

1. The overall program of work continues as outlined in Section C-2 of the Proposal submitted to NSF on October 8, 1996.
2. The ongoing program to construct and set up the test interferometer system for experimental investigations of magnetic levitation systems and coupled suspensions has continued. The problems with a commercial frequency-doubled NdYAG laser outlined in our previous Report caused us to switch to an undoubled NdYAG laser with a separate cavity doubler, and design and construction of a special doubler system is progressing well. Some of the control electronics for this cavity doubler are being adapted from the LIGO PMC design.
3. Concurrently with this main construction effort, significant progress has been made in the exploratory research to investigate possible use of other high-Q materials. Special techniques have been developed for measurement of mechanical Q in small samples, and encouraging results are being obtained. Further work in this area is continuing, and a special test system, separate from the main interferometer, is being developed.
4. While the construction and exploratory work outlined above continues, other ideas for obtaining higher performance in laser interferometers have been investigated, and contributions to possible LIGO II suspension concepts, including the GAS/inverted pendulum design, are being made. Overall the project is proceeding well and as planned, and continues to stimulate new ideas and concepts in other areas relating to gravitational wave detection.