

## **LSC Six-Month Progress Report**

**Organization** German/British Collaboration for Detection of Gravitational Waves  
(GEO600)

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Attachment C / Lasers and Optics

Over the last six months the following progress has been made:

Due to problems with the locking of the dual recycled GEO detector and the S3 science run the implementation of the outer loop power stabilization at the GEO detector and investigations on the PSL were postponed to the next MOU period.

In addition the AEI laser laboratory had to move into a different building over this MOU period and hence only a limited number of experiments could be conducted.

A new version of the 15W GEO type slave laser was build by the Laser Zentrum and transferred to the University Laboratory. The laser itself is very similar to the GEO laser but the control electronics and computer interface were built in the same way as in the concept for the AdLIGO PSL. First test of this system has been performed and will continue with injection locking experiments.

The power stabilization experiment could demonstrate RIN levels below  $6E-9/\sqrt{\text{Hz}}$  between 60Hz and 5kHz. At a Fourier frequency of 10 Hz the noise rises to  $2E-8/\sqrt{\text{Hz}}$ . The design of the feedback control loop was changed to an AC coupled version and is ready for testing. It is expected, that this new design will improve the performance at 10Hz.

Benno Willke worked with LIGO on the schedule and costing for the AdLIGO PSL subsystem.

Benno Willke co-coordinated the work of the Laser Working Group of the LSC. Monthly teleconferences were organized and minutes of these calls were circulated.