

# LSC Six-Month Progress Report

LIGO-M040029-00-M

**Organization** Trinity University LIGO Group (TULG)

**Report Date** August 2003 – February 2004

## Attachment A

The following milestones were accomplished in the Trinity University LIGO Group's first six months:

- (a) Dr. Dennis Ugolini and undergraduate Ben Sadler built up a laser laboratory from an empty room, and procured and commissioned an Innolight Mephisto CW laser, 500 mW @ 1064  $\mu\text{m}$ . Sadler measured the propagation,  $M^2$ , and astigmatism of the laser, the results of which were presented at the December PAC meeting<sup>1</sup>.
- (b) Ugolini and Sadler attempted to characterize the intensity noise of the Innolight laser; unfortunately the noise floor of our very old signal analyzer becomes significant above about 3 kHz, so final results will have to wait until new equipment arrives.
- (c) Ugolini, Sadler, and undergraduate Skyler Saucedo are in the process of designing a servo to actuate on fluctuations in the current delivered by the Innolight power supply. This effort is expected to continue into the summer.
- (d) Dr. Ugolini filled two expert shifts on November 22-23 at LLO during the S3 run.
- (e) The Trinity University LIGO Group continues to maintain a dialogue with Rich Abbott at LLO on future ISS efforts, such as providing a standardized testbed for characterizing the behavior of different photodiodes for use in sensing intensity fluctuations.

Goals for the next six months:

- (a) Procure a Stanford Research Systems SR780 dynamic signal analyzer to characterize the intensity noise of the Innolight laser, as well as the correlation between current supply fluctuations and intensity noise.
- (b) Complete a servo to actuate on the current supply to the laser, and measure the effect on intensity noise. Also, at the suggestion of Robert Byer, procure a single-pass Lightwave power amplifier and repeat the experiment for the current supply to this device.
- (c) Measure the effect of beam jitter on the readout of photodiodes, and begin designing a servo to stabilize steering of the beam onto an intensity noise sensor.
- (d) Continue manning shifts during engineering and science runs, and maintaining a dialogue with the ISS working group.
- (e) Become re-involved with the detector characterization effort leading into the next science run.

<sup>1</sup> D. Ugolini, "RUI – Development of a LIGO Pre-Stabilized Laser Prototype Laboratory for Improving Intensity Noise Stabilization", LIGO G030682-00-Z.

## Attachment Z

Here is updated contact information for Dr. Ugolini at Trinity University:

<b>Name</b>	<b>Address</b>	<b>E-Mail</b>	<b>Phone Nos.</b>	<b>Begin Date</b>	<b>End Date</b>
Ugolini, Dennis 100% LIGO I 50% AdvLIGO 50%	Dept. of Physics Trinity University One Trinity Place San Antonio, Texas 78212-7200	dugolini@ trinity.edu	210-999-7890 Fax:210-999- 7423	Feb. 15, 2004	Aug. 15, 2004