

LIGO Takes Some Data!

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Many members of the LIGO Scientific Collaboration (LSC) spent The final days of 2001 and the early days of 2002 at the LIGO observatories in Hanford, Washington, and Livingston, Louisiana, participating in the seventh LIGO engineering run (E7). Unlike previous LIGO engineering runs which focused on characterizing the interferometers and improving their reliability, the goal of E7 was to provide data for a first end-to-end test of the data analysis pipeline, to test data acquisition and archiving, gain experience with round-the-clock interferometer operation and detector monitoring.

For 2 weeks teams of scientists and operators attempted to keep the three LIGO interferometers locked and taking data. Although the LIGO interferometers still have a long way to go to reach their design sensitivity, the data recorded during E7 will provide LSC scientists with the real interferometer data needed for perfecting and tuning their gravitational wave search algorithms. In addition to the three LIGO interferometers, we were fortunate to have the GEO-600 interferometer near Hanover, Germany and the Allegro bar-detector at Louisiana State University operating in cooperation with LIGO during much of the run.

To maximize the overlap of the lock times among the interferometers each LIGO interferometer was operated in a configuration that minimized the risk of down time. The 2~km interferometer at Hanford was operated in its final power-recycled mode. Because the commissioning of the 4~km interferometers at Hanford and Livingston has been scheduled to lag that of the 2~km instrument, their power-recycling mode is not yet reliable enough for extended data taking. The 2~km instruments were therefore operated in a non-recycled mode to improve overall lock-time.

The E7 run, like previous runs, was an occasion for large number of LSC scientists to participate actively in the operation of the interferometers and to perform other scientific activities at the observatories. Monitoring programs ran continuously to help the operators and scientists keeping tabs on the current interferometer status, and preliminary analysis of the data collected during the E7 run took place using the LIGO Data Analysis Systems (LDAS) at the sites. In addition, off site analysis occurred on smaller selected data sets at Caltech and MIT. In the end, over 13 TB of data from nearly 8000 interferometer and environmental channels had been collected and archived.

The three interferometers were individually locked for ~60-70% of the run, with the majority of that time (~40-60% of the total) in locked segments long enough for meaningful analysis (more than 15 minutes). The total time with all three interferometers locked was 140 hours (~34%), out of which 71 hours (~18%) represent segments longer than 15 minutes. Considering the early stage in the commissioning, we are rather pleased with this performance.

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More information about LIGO can be found at: <http://www.ligo.caltech.edu/>