

# LSC Six-Month Progress Report

**LIGO-M010255-00-M**

**Organization** California State University Dominguez Hills Elementary Particles and Relativity Group

**Report Date** February 15, 2001

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**Attachment** A - LIGO I

## **Participation**

### **Imperfect Optics Simulations for the upgraded 40m IFO (August 15 2000-February 15, 2001)**

(Ganezer, Jennings, Keig, Wiley, Brulois)

We modified the Dual Recycling version of FFT under the MPI architecture such that it would run on the CACR V-Class HP cluster. Our initial results for the upgraded 40m optical configuration were reasonable. We obtained first results for the 40m IFO on imperfect optics that were reasonable in terms of accepted parameters such as contrast defect. Results on 40m imperfect optics calculations were presented by Ganezer at the March 2001 LSC meeting.

### **Efforts in installing the PSL and tests of active vibration isolation for the 40m IFO**

(Ganezer, Jennings, Keig)

We visited Caltech several times to talk to discuss the STACIS active vibration isolation system testing and PSL installation. Ganezer was present several times when accelerometer and seismometer data was taken for various modes of shaking of the optical chambers with STACIS. A Caltech undergraduate and former CSUDH on-campus high school student (Katie Mack) was hired by CSUDH to work on STACIS and on various aspects of the 40m Physical Environment Monitoring (PEM) System (PEM is related to vibration isolation). Ganezer attended a phone conference on PEM with experts from the 40m and Hanford.

The installation of the PSL was delayed by LIGO laboratory until May and June of 2001.

### **LIGO as a full member of SNEWS and tests of on-line triggers and neutrino pointing for SNs**

(Ganezer and Keig)

LIGO became a member of SNEWS that is capable of receiving alarms. At present only the Super-K and LVD experiments formulate alarms for SNEWS while AMANDA and SNO will send alarm information on-line. So LIGO is now as much a full member of SNEWS as are two of the four major neutrino projects. We suggested the use of the Z-M catalog as a possible on-line trigger and along with Szabi Marka and others formulated a general plan for testing on-line SN triggers (see LIGO U00004-00-Z and LIGO G00313-00-D). The actual testing of such triggers was postponed until the engineering runs of 2001 or data runs of 2002.

We determined that the present on-line angular resolution for a neutrino burst from a galactic supernova was somewhere between 5 and 10 degrees. Scenarios to optimize SN pointing accuracy with low energy neutrinos were discussed by Ganezer with some members of the Super-Kamiokande low-energy group. Ganezer familiarized himself with the Super-K on-line SN alarm and pointing software and had practical experience using these interactive programs as a shift leader during a real Super-K SN alarm that unfortunately turned out to be a false alarm. Ganezer attended an international conference in Marina Del Rey California on detection of galactic type II Supernovae that included a meeting of SNEWS member institutions. Ganezer looked into the possibility of correlating Super-K high-energy muon neutrino interactions (so-called upward going muon events) with gravity wave measurements. Correlations between neutrinos and gravity waves were discussed by Ganezer at burst group meetings.