Section 4
LASER SYSTEM REPORT

4.A GDL Facility Report

GDL was active the entire period as a target interaction facility. The various experiments supported by GDL included x-ray conversion tests; preliminary studies for x-ray laser experiments; a number of shots to evaluate the benevolent smoothing effect of irradiating targets with laser beams that pass through a background inert gas, such as helium; and several ALPHA backlight experiments, where the GDL beam was transported to the OMEGA chamber.

A summary of GDL operations for this quarter follows:

Target Shots (BETA)	213
ALPHA Shots	5
Pointing Shots	83
Beamline Test Shots	99
TOTAL	400

4.B OMEGA Facility Report

The OMEGA laser system spent the entire period serving as a target irradiation facility for various experimental campaigns. On-target energy from the system remained at approximately 1.5 kJ. The beam-to-beam energy imbalance was reduced as low as 3%. The energy and

uniformity levels were sufficient to drive several targets to densities exceeding 50 times liquid DT density. By the end of the period, the first shots were being taken on targets frozen to solid DT temperatures. This was made possible by the installation of the cryogenic target system designed and fabricated by KMS Fusion.

Throughout April, the laser system was put to extensive service in support of the high-density campaign. The ALPHA beam, i.e., the GDL output transported to the OMEGA chamber, was put in service for several x-ray backlight experiments. Time-resolved ionization studies and secondary neutron activation experiments were also conducted during this period.

During May the laser was used for NLUF experiments. Eight of the OMEGA beams were focused inside a "jet" of inert gas injected into the chamber at a velocity of Mach 2 to study x rays. Late in May, the target chamber left service for the installation of the cryogenic target positioner. While not in service as a target facility, the laser was used to measure driver-line phase, with the objective of improving overall system uniformity. In addition, the pinholes were tested in selected spatial filters, and damage tests were performed on liquid-crystal polarizers. The polarizers withstood IR fluences required to produce 85 J of UV per beam. This would lead to system UV energies in excess of 2 kJ.

The last part of the period was spent activating the cryogenic target positioner. Many members of the operations group were involved in support of the installation and activation. Throughout the activation period, OMEGA provided shots on demand for checkout and for initial implosion experiments using cryogenic targets.

A summary of OMEGA operations for this quarter follows:

Target Shots	174
Beamline Test Shots	59
Driver-Line Shots	86
TOTAL	319

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