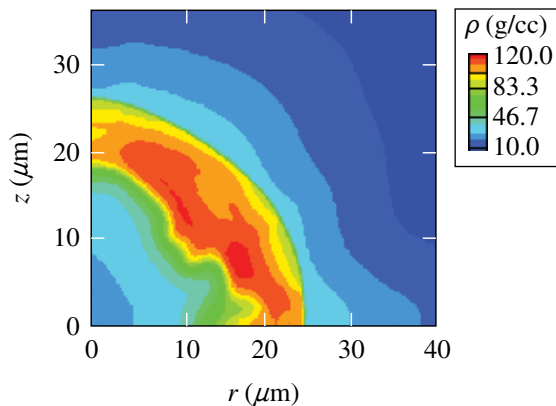


About the Cover:

The cover photo highlights scientist Dr. Radha Bahukutumbi presenting new OMEGA polar-drive target designs. In the background is a schematic that illustrates the 40 OMEGA beams that emulate the NIF x-ray-drive beam geometry. Being an indirect-drive implosion facility, NIF has no laser beams at the equator, which requires modification of the traditional, symmetric direct drive to achieve adequate symmetry. The concept of using the NIF laser with its beams repointed toward the equator is called polar drive and enables one to conduct direct-drive experiments to be carried out on the NIF while it is in its standard x-ray-drive configuration. To emulate polar drive on OMEGA, 20 equatorial beams are dropped and the remaining 40 beams are repointed toward the target's equator. The OMEGA experiments yield valuable data to develop and validate models of laser-energy deposition, heat conduction, nonuniformity growth, and fuel assembly in polar-drive geometry.



The figure on the left shows a plot of the isodensity contours of a stagnated shell at peak compression obtained from a two-dimensional simulation using the radiation-hydrodynamics code *DRACO*. This OMEGA polar-drive implosion uses a 600- μm -outer-diameter cryogenic-DT fuel target driven with 12.8 kJ of laser energy at a NIF-relevant $7 \times 10^{14}\text{-W/cm}^2$ intensity and attains a peak fuel areal density of $\sim 240\text{ g/cm}^2$. An optimized combination of beam pointings, energies, and profiles results in a nearly symmetrical stagnated core. Experiments using these high-intensity implosion designs will commence when new smaller-beam-diameter OMEGA phase plates are obtained.

This report was prepared as an account of work conducted by the Laboratory for Laser Energetics and sponsored by New York State Energy Research and Development Authority, the University of Rochester, the U.S. Department of Energy, and other agencies. Neither the above named sponsors, nor any of their employees, makes any warranty, expressed or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or usefulness of any information, apparatus, product, or process disclosed, or represents that its use would not infringe privately owned rights. Reference herein to any specific commercial product, process, or service by trade name, mark, manufacturer, or otherwise, does not necessarily constitute or imply its endorsement, recommendation, or favoring by

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The work described in this volume includes current research at the Laboratory for Laser Energetics, which is supported by New York State Energy Research and Development Authority, the University of Rochester, the U.S. Department of Energy Office of Inertial Confinement Fusion under Cooperative Agreement No. DE-FC52-08NA28302, and other agencies.

Printed in the United States of America

Available from

National Technical Information Services

U.S. Department of Commerce

5285 Port Royal Road

Springfield, VA 22161

www.ntis.gov

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