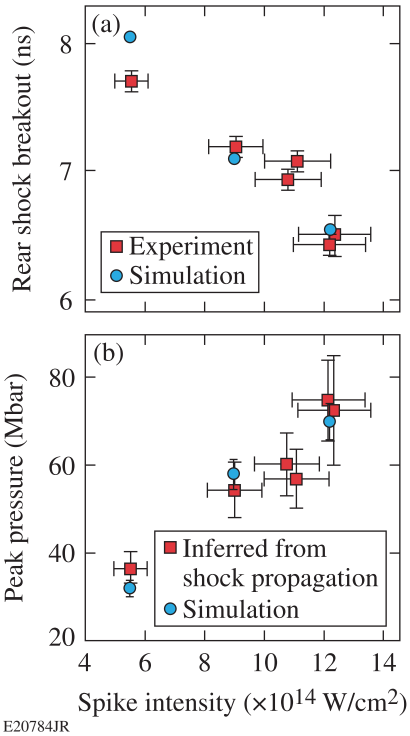
About the Cover:



The cover photo highlights LLE's scientists Dr. Matthias Hohenberger and Dr. Wolfgang Theobald, who have led shock-ignition (SI) experiments on the OMEGA Laser System. In contrast to the conventional central-hot-spot–ignition concept, shock ignition separates the fuel-assembly and ignition stages by using shaped high-intensity laser spikes at the end of the compression pulse. The ablatively driven strong shock of a few hundred Mbar, launched by the high-intensity spike, converges in the central hot spot of the fusion capsule and raises the hot-spot pressure to ignition conditions. To explore the viability of this ignition scheme, it is essential to understand how strong shocks can be generated in long-scale-length plasmas by high-intensity laser spikes. The article on p. 137 presents experimental and simulation results on strong-shock generation with planar targets closely relevant to the SI concept. The background of the photo shows an example of experimental data from the velocity interferometer system for any reflector (VISAR) and streaked optical pyrometer (SOP) diagnostics.

The figure shows (a) the experimental data for shock break-out time at the rear surface of a planar target (squares) in comparison with radiation–hydrodynamic simulations (circles) and (b) the inferred peak pressure as a function of the laser spike intensity. Based on these results, at an intensity of 1.2×10^{15} W/cm^2, a 70-Mbar shock was generated in the presence of a 350-μm pre-plasma. This is the highest pressure reported at SI-relevant conditions and an important step toward experimentally validating the SI concept.

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