***Absorption in OMEGA Implosion Experiments:*** Absorption in OMEGA implosion experiments is routinely measured using scattered-light calorimetry in the two full-aperture backscatter stations (FABS25 and 30) (Fig. 1). The measured and predicted absorption fractions of many different pulse shapes and targets with strongly varying absorption fractions are plotted in this figure. In several shots the *LILAC* simulations were carried out using various ways of modeling thermal electron transport, resulting in a spread of predicted absorption fractions as indicated in the solid black squares in Fig. 1.

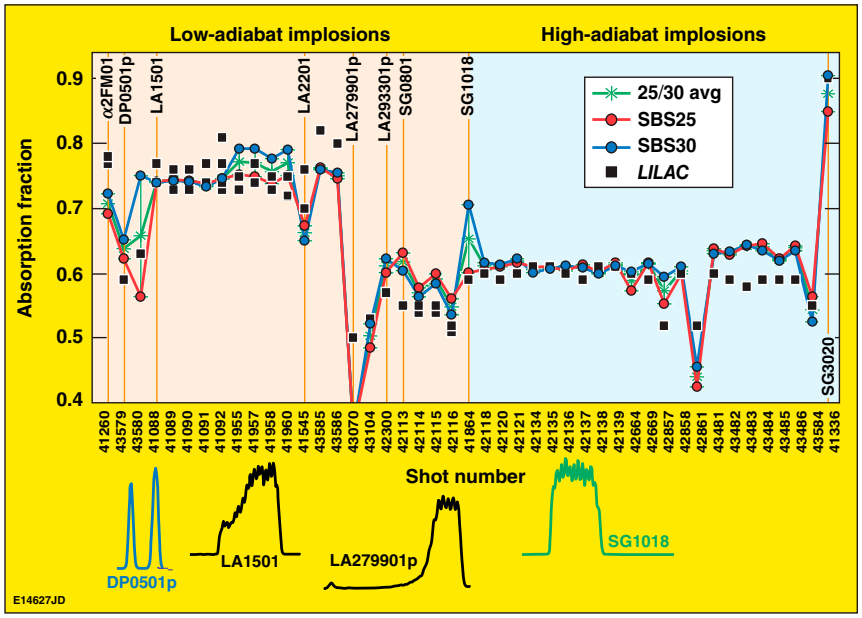


Figure 1. Time-integrated absorption measurements for OMEGA implosion experiments. Red and blue dots are FABS calorimetry measurements and black squares are *LILAC* simulations carried out with standard flux-limiter values ($f = 0.06$) or with modified electron transport models.

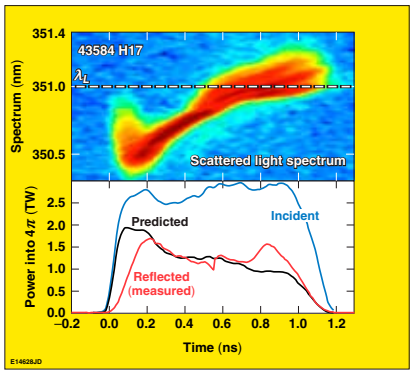


Figure 2. Time-resolved scattered-light spectrum for a square pulse implosion experiment on OMEGA.

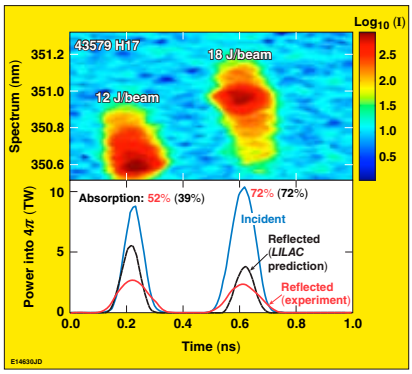


Figure 3. Double-pulse spherical target experiment to investigate time-varying absorption at early times.

While the time-integrated absorption values agree with predictions under many different experimental conditions across a large number of shots, a detailed analysis of time-resolved, scattered-light measurements shows there is a consistent difference in absorption during the first 100 to 200 ps for all shots. As seen in Figs. 2 and 3 there is a measurable discrepancy between the measured (red lines) and predicted (black lines) scattered-light powers. This discrepancy is most apparent in the double-pulse experiment in Fig. 3, where the time-integrated absorbed energies in the two pulses are compared with the predictions. (Note that the time resolution of the detectors in these experiments is not able to fully resolve the time evolution of the scattered-light signal.) The data clearly show that the first pulse is absorbed much more strongly than predicted, while the absorption of the second pulse is predicted very well (Fig. 3).

The time-integrated measurements are not significantly affected by this discrepancy. However, increased early absorption can significantly affect target dynamics, since it can lead to an increased first shock that can change the target adiabat. There are indications that the predicted neutron bang times are slightly longer than the measured bang times, consistent with a stronger coupling of the laser to the target at early times. We have recently launched an effort to investigate these effects both experimentally and theoretically.

***OMEGA Operations Summary:*** During May 2006, OMEGA provided a total of 147 target shots: LLE (72), NLUF (10), LLNL (35), SNL (6), and LANL (24). Of the total, 29 shots were for NIC and 42 shots were for HED, respectively. The NLUF experiments were carried out by a team led by the University of Michigan.

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