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Scattered-Laser-Light Spectroscopy in Direct-Drive Implosion Experiments D.H. EDGELL, W. SEKA, J.A. DELETTREZ, R.S. CRAXTON, V.N. GONCHAROV, I.V. IGUMENSHCHEV, J. MYATT, A.V. MAXIMOV, R.W. SHORT, T.C. SANGSTER, R.E. BAHR, Laboratory for Laser Energetics, U. of Rochester — The time-dependent laser absorption during spherical direct-drive implosions on OMEGA is inferred from scattered-light spectroscopy. We compare measured spectral shifts for different pulse shapes with the shifts predicted using a hydrodynamic code. The predictions vary dramatically with the electron-heat-conduction model. A nonlocal transport model provides the best match to the measurements. The modeling calculates the "blow-by" signal from the beam opposite the detector, improving the measurements of total scattered light. Remaining spectral discrepancies suggest nonlinear energy exchange between crossed beams due to stimulated Brillouin scattering. Analogous planar experiments test this hypothesis. This work was supported by the U.S. Department of Energy Office of Inertial Confinement Fusion under Cooperative Agreement DE-FC52-92SF19460.

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