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Measurements of Bubble Evolution in the Nonlinear Ablative Rayleigh–Taylor Instability O. SADOT, Laboratory for Laser Energetics, U. of Rochester, NRCN, and Ben Gurion University of Negev, V.A. SMALYUK, J.A. DELETTREZ, D.D. MEYERHOFER, T.C. SANGSTER, R. BETTI, V.N. GONCHAROV, Laboratory for Laser Energetics, D. SHVARTS, NRCN and Ben Gurion University of Negev — Rayleigh–Taylor instability plays a crucial role in inertial confinement fusion, astrophysics, and other applications. In the present work, 3-D broadband modulations were imprinted by laser nonuniformities on a planer target and were measured at the late nonlinear stage using face-on radiography. The high quality of the results enabled us to determine for the first time the instability evolution in terms of bubble size, amplitude, and velocity distributions. During the evolution, as the bubbles compete and merge, the modulations reach a self-similar regime in which the modulations σ_{rms} and bubble size λ grow as $\sim gt^2$, where g and t are the foil acceleration and time, respectively. A phenomenological description of the evolution of the bubble distribution based on the self-similar evolution will be presented. This work was supported by the U.S. Department of Energy Office DOE of Inertial Confinement Fusion under Cooperative Agreement No. DE-FC52-92SF19460.

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