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3D broadband Bubbles Dynamics for the imprinted ablative Rayleigh-Taylor Instability ALEXIS CASNER, CELIA, S KHAN, LLNL, C. MAILLIET, CELIA, D. MARTINEZ, N. IZUMI, LLNL, E. LE BEL, CELIA, B.A. REMINGTON, L. MASSE, V.A. SMALYUK, LLNL — We report on highly nonlinear ablative Rayleigh-Taylor growth measurements of 3D laser imprinted modulations. These experiments are part of the Discovery Science Program on NIF. Planar plastic samples were irradiated by 450 kJ of 3w laser light and the growth of 3D laser imprinted modulations is quantified through face-on radiography. The initial seed of the imprinted RTI is imposed by one beam focused in advance (-300 ps) without any optical smoothing (no CPP, no SSD). For the first time four generations of bubbles were created as larger bubbles overtake and merge with smaller bubbles because of the unprecedented long laser drive (30 ns). The experimental data, analyzed both in real and Fourier space, are compared with classical bubble-merger models [1], as well as recent theory and simulations predicting 3D bubbles reacceleration due to vorticity accumulation caused by mass ablation [2]. These experiments are of crucial importance for benchmarking 2D and 3D radiation hydrodynamics code for Inertial Confinement Fusion. [1] D. Oron et al., Phys. Plasmas 8**,** 2883 (2001). [2] R. Yan et al., Phys. Plasmas 23, 022701 (2016).

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