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**Ablative Rayleigh-Taylor and Richtmyer-Meshkov Instabilities in Laser-Accelerated Colliding Foils**[1] Y. AGLITSKIY, N. METZLER, SAIC, M. KARASIK, V. SERLIN, J. WEAVER, S.P. OBENSCHAIN, J. OH, A.J. SCHMITT, A.L. VELIKOVICH, S.T. ZALESAK, Plasma Physics Division, NRL, J.H. GARDNER, Berkeley Research Associates, E.C. HARDING, University of Michigan — In our experiments done on the Nike KrF laser, we study instability growth at shock-decelerated interfaces in planar colliding-foil experiments. We use streaked monochromatic (1.86 keV) x-ray face-on imaging diagnostics to measure the areal mass modulation growth caused by the instability. Higher x-ray energies up to 5.25 keV are used to follow the shock propagation as well as the 1D dynamics of the collision. While a laser-driven foil is accelerated towards the stationary low-density foam layer, an ablative RT instability develops. Having reached a high velocity, the foil hits the foam layer. The impact generates strong shocks in the plastic and in the foam. The reflected shock wave re-shocks the ablation front, its acceleration stops, and so does the observed RT growth. This is followed by areal mass oscillations due to the ablative RM instability and feedout mechanisms, of which the latter dominates.

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