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**On the numerical simulation of the ablative Rayleigh-Taylor instability in laser-driven ICF targets using the FastRad3D code**[1] JASON BATES, ANDREW SCHMITT, STEVE ZALESAK, U.S. Naval Research Laboratory — The ablative Rayleigh-Taylor (RT) instability is a key factor in the performance of directly-drive inertial-confinement-fusion (ICF) targets. Although this subject has been studied for quite some time, the accurate simulation of the ablative RT instability has proven to be a challenging task for many radiation hydrodynamics codes, particularly when it comes to capturing the ablatively-stabilized region of the linear dispersion spectrum and modeling ab initio perturbations. In this poster, we present results from recent two-dimensional numerical simulations of the ablative RT instability that were performed using the Eulerian code FastRad3D at the U.S. Naval Research Laboratory. We consider both planar and spherical geometries, low and moderate-Z target materials, different laser wavelengths and where possible, compare our findings with experiment data, linearized theory and/or results from other radiation hydrodynamics codes. Overall, we find that FastRad3D is capable of simulating the ablative RT instability quite accurately, although some uncertainties/discrepancies persist. We discuss these issues, as well as some of the numerical challenges associated with modeling this class of problems.

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