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3D Laser Imprint Using a Smoother Ray-Traced Power Deposition Method[1] ANDREW J. SCHMITT, Plasma Physics Division, Naval Research Laboratory, Washington DC — Imprinting of laser nonuniformities in directly-driven icf targets is a challenging problem to accurately simulate with large radiation-hydro codes. One of the most challenging aspects is the proper construction of the complex and rapidly changing laser interference structure driving the imprint using the reduced laser propagation models (usually ray-tracing) found in these codes. We have upgraded the modelling capability in our massively-parallel FASTRAD3D code by adding a more realistic EM-wave interference structure. This interference model adds an axial laser speckle to the previous transverse-only laser structure, and can be impressed on our improved smoothed 3D raytrace package. This latter package, which connects rays to form bundles and performs power deposition calculations on the bundles, is intended to decrease ray-trace noise (which can mask or add to imprint) while using fewer rays. We apply this improved model to 3D simulations of recent imprint experiments performed on the Omega-EP laser and the Nike laser that examined the reduction of imprinting due to very thin high-Z target coatings. We report on the conditions in which this new model makes a significant impact on the development of laser imprint.

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