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Seeding of capsule instability growth by fill tubes and support rods for inertial confinement fusion implosions¹ ANDREW MACPHEE, DANIEL CASEY, DANIEL CLARK, JOHN FIELD, STEVEN HAAN, BRUCE HAMMEL, JEREMY KROLL, OTTO LANDEN, DAVID MARTINEZ, JOSE MILOVICH, ABBAS NIKROO, Lawrence Livermore Natl Lab, NEAL RICE, General Atomics, HARRY ROBEY, VLADIMIR SMALYUK, MICHAEL STADERMANN, CHRISTOPHER WEBER, Lawrence Livermore Natl Lab, LAWRENCE LIVERMORE NATIONAL LABORATORY COLLABORATION, GENERAL ATOMICS COLLABORATION — Features associated with the target support tent and deuterium-tritium fuel fill tube and support rods can seed hydrodynamic instabilities leading to degraded performance for inertial confinement fusion (ICF) experiments at the National Ignition Facility. We performed in-flight radiography of ICF capsules in the vicinity of the capsule support tent and fill tube surrogates to investigate instability growth associated with these features. For both plastic and high density carbon ablators, the shadow of the $10\mu\text{m}$ diameter glass fill-tube cast by the x-ray spots on the hohlraum wall were observed to imprint radial instabilities around the fill tube/capsule interface. Similarly, instability growth was observed for the shadow cast by $12\mu\text{m}$ diameter silicon carbide capsule support rods mounted orthogonal to the fill tube as a tent alternative for a plastic ablator. The orientation of the shadows is consistent with raytracing.

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