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Quantifying wetted foams shock-front non-uniformities with 2D VISAR: two-photon polymerization foams wetted with cryogenic D_2

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Highly complex techniques involving millikelvin temperature control are necessary to prepare the single crystalline thin shell of dense DT fuel inside the millimeter-sized capsules for inertial confinement fusion ignition experiments at the National Ignition Facility. Alternatives to such complex and time-consuming techniques are therefore highly desirable to conceive a pathway towards low-cost mass-produced targets suitable for high repetition rate implosions for Inertial Fusion Energy research.

Foams printed using 2-Photon Polymerization (2PP) and wetted with liquid DT provide a promising approach, creating a strong need for experimental and numerical studies of the behavior of wetted foams under shock compression. We will discuss recent 2D VISAR experiments fielded at the Omega laser facility documenting how various wetted foam structures affect the uniformity of the transmitted shock in cryogenic liquid D_2.

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