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2.34 Geometric fractionation of the NIF hohlraum debris

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Inertial confinement fusion experiments at NIF utilize a hohlraum, consisting of materials such as gold, uranium, aluminum and/or copper, that can provide potential diagnostic information when coupled with high-yield deuterium-tritium fueled shots. During such experiments, mega-joules of laser energy delivered inside the hohlraum results in its complete destruction and distribution of the material masses inside the target chamber. The collection and analysis of the scattered hohlraum debris are critical for the development of diagnostic capabilities. Previous diagnostics, such as Solid Radiochemistry (SRC), have relied on the collection of hohlraum debris by deploying large solid-angle collector systems to ensure sufficient amount of the hohlraum material was collected for providing a high-fidelity diagnostic measurement. In an effort to better understand the hohlraum debris distribution, we have performed several experiments at NIF where known amounts of various materials were mounted to the hohlraum. Results from these experiments, which will be presented in detail, indicate a strong geometric behavior of the post-shot hohlraum debris distribution.

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