# OVERVIEW OF THE BE ABLATOR CAMPAIGN ON THE NATIONAL IGNITION FACILITY

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Beryllium (Be) has long been known as an excellent ablator for ICF with higher mass ablation rates than carbon-based ablators leading to higher ablation pressures and ablation velocities [R. E. Olson *et al.*, PoP (2011)]. These properties enable target designs with higher implosion velocities and improved hydrodynamic stability through more effective ablative stabilization. Over the last year, the first experiments using Be ablators have been conducted at the National Ignition Facility. This campaign has completed a series of experiments to tune and assess a three-shock high adiabat target design [S. A. Yi *et al.*, PoP (2014).]. The design is intended to be similar to that of the first "high foot" experiments [O. A. Hurricane *et al.*, Nature (2014)] with CH capsules to enable direct comparisons of the performance between the two ablators, as well as provide additional benchmarks for the ICF design codes. Measurements of the shock timing, capsule implosion velocity, core implosion shape from self-emission, in-flight shape of the capsule from backlight imaging, and laser backscatter have been performed and are being used to prepare for the first DT layered implosion with a Be capsule in the summer of 2015. In the meantime, the tuning experiments have provided key insights into the performance of Be ablators. Measurements of the x-ray driven shocks during the "foot" of the drive pulse show the modelling is in good agreement with the data. The implosion experiments show the laser backscatter is similar to CH targets under similar drive conditions. Measurements of the implosion shape, both core self-emission and backlight images of the shell in-flight [J. R. Rygg, *et al.*, PRL (2014)], indicate there is no significant reduction of laser energy in the inner cone beams reaching the hohlraum wall with respect to CH ablators. This alleviates the prior concern that the higher mass ablation rate for Be would further reduce the laser energy as it passed between the capsule and the hohlraum wall compared to CH. Implosion velocity measurements [E. L. Dewald, *et al.*, O.Mo_B1, IFSA, 2013] from backlight capsule implosions show that the laser energy coupled to the hohlraum, as well as the effective x-ray drive, are comparable if not better for Be than for CH ablators. The collection of data shows the effective x-ray drive on the capsule is similar between CH and Be ablators pointing to the hohlraum modelling as the source of the ~15% reduction in the laser power needed in order for simulations of ICF implosions in gas filled hohlraums to match the data. This presentation will reviews the three-shock Be target design, compare the modeling to the experiments, as well as compare with experiment results from CH "high foot" with similar laser pulses.

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