

Abstract Submitted
for the DPP14 Meeting of
The American Physical Society

Unique capabilities for ICF and HEDP research with the KrF laser¹ STEPHEN OBENSCHAIN, JASON BATES, LOP-YUNG CHAN, MAX KARASIK, DAVID KEHNE, JOHN SETHIAN, VICTOR SERLIN, JAMES WEAVER, U.S Naval Research Laboratory, JAECHUL OH, Research Support Instruments, BRUCE JENKINS, Berkeley Research Associates Inc., ROBERT LEHMBERG, Research Support Instruments, FRANK HEGELER, STEPHEN TERRELL, Commonwealth Technology, YEFIM AGLITSKIY, Leidos, ANDREW SCHMITT, U.S Naval Research Laboratory — The krypton-fluoride (KrF) laser provides the shortest wavelength, broadest bandwidth and most uniform target illumination of all developed high-energy lasers. For directly driven targets these characteristics result in higher and more uniform ablation pressures as well as higher intensity thresholds for laser-plasma instability. The ISI beam smoothing scheme implemented on the NRL Nike KrF facility allows easy implementation of focal zooming where the laser radial profile is varied during the laser pulse. The capability for near continuous zooming with KrF would be valuable towards minimizing the effects of cross beam energy transport (CBET) in directly driven capsule implosions. The broad bandwidth ISI beam smoothing that is utilized with the Nike KrF facility may further inhibit certain laser plasma instability. In this presentation we will summarize our current understanding of laser target interaction with the KrF laser and the benefits it provides for ICF and certain HEDP experiments. Status and progress in high-energy KrF laser technology will also be discussed.

¹Work supported by the Department of Energy, NNSA

Stephen Obenschain
U.S Naval Research Laboratory

Date submitted: 11 Jul 2014

Electronic form version 1.4