

Abstract Submitted
for the DPP11 Meeting of
The American Physical Society

Demonstration of a Gain-Saturated 8.8 nm Table-Top Soft X-Ray Laser at 1 Hz Repetition Rate¹ JORGE ROCCA, DAVID ALESSI, YONG WANG, BRADLEY LUTHER, LIANG YIN, DALE MARTZ, MARX BERRILL, VYACHESLAV SHLYAPTSEV, MARK WOOLSTON, Colorado State University — There is significant interest in extending compact plasma-based lasers to sub-10 nm wavelengths to be able to realize table-top experiments with high intensity laser pulses at these wavelengths. However, the steep wavelength scaling of the optical pump laser energy necessary imposes a challenge and has limited gain-saturated table-top lasers that can operated at high repetition rate to wavelength above 10.9 nm [1]. We report the demonstration of gain-saturated laser operation at $\lambda = 8.85$ nm in the $4d^1S_0 \rightarrow 4p^1P_1$ line of nickel-like lanthanum ions in a plasma column created at 1 Hz repetition rate by focusing pulses from a Ti:Sapphire laser with a total of 7.5 J energy onto a lanthanum slab. We have observed strong lasing at 8.5 nm in nickel-like cerium.

[1] D. Alessi, D. H. Martz, Y. Wang, M. Berrill, B. M. Luther, and J. J. Rocca. Optics. Lett. Vol. 35, 414 (2010).

¹Work supported by the Eng. Research Centers Program of the National Science Foundation and by the Chemical Sciences, Geosciences and Biosciences Division, Office of Basic Energy Sciences, U.S. Department of Energy

Jorge Rocca
Colorado State University

Date submitted: 26 Jul 2011

Electronic form version 1.4