

Abstract Submitted  
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**High repetition rate tabletop soft x-ray lasers at wavelengths down to 11.9 nm in Nickel-like ions**<sup>1</sup> BRADLEY M. LUTHER, YONG WANG, MIGUEL A. LAROTONDA, DAVID ALESSI, MARK BERRILL, NSF ERC for Extreme Ultraviolet Science and Technology, Colorado State University, VYACHESLAV N. SHLYAPTSEV, Dept. of Applied Science, UC Davis-Livermore, JORGE J. ROCCA, EUV ERC, Colorado State Univ. — There is significant interest in the development of high average power table-top soft x-ray lasers (SXL) for applications. The repetition rate of gain-saturated collisional SXL operating at wavelengths of less than 30nm has been limited to one shot every several minutes by the large laser pump energy required to heat the plasma. Recent experiments have demonstrated a large pump energy reduction by directing the heating pulse into the plasma at grazing incidence [1-3]. This pumping geometry takes advantage of the refraction of the pump beam in the plasma to deposit a large fraction of its energy into the gain region. Here we report 5Hz repetition rate operation of gain-saturated tabletop lasers with 1-2 $\mu$ W average power in transitions of Ni-like ions (Mo, Ru, Pd, Ag and Cd) at wavelengths between 18.9nm and 13.2nm, using a 1J, 8 ps heating pulse from a Ti:Sa laser. Strong amplification was also observed at 11.9 nm in Ni-like Sn.

1. R. Keenan et al, Phys. Rev. Lett., 94, 103901, (2005). 2. B. M. Luther et al, Opt. Lett., 30, 165, (2005). 3. D. Alessi et al, Opt. Express, 13, 2093, (2005).

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