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Modeling of efficient soft x-ray lasers in transitions of nickel-like and neon-like ions. M. BERRILL, I. ELLIS, D. ALESSI, J.J. ROCCA, NSF ERC for Extreme Ultraviolet Science and Technology, Colorado State University, V.N. SHLYAPSEV, University California Davis at Livermore — We have modeled the plasma physics and amplification process in efficient soft x-ray lasers generated by rapid heating of plasmas by a short (8 ps) optical laser pulse of $\sim$ 1 J energy impinging at grazing incidence. This geometry allows for the efficient pumping of high repetition rate soft x-ray lasers [1-3]. The two temperature model includes all hydrodynamic equations written in 1.5D, as well a complete atomic model and multi-cell radiation transport. The equations that yield a full description of the plasma are solved using a finite difference method in a Lagrangian coordinate scheme. A post processor performs ray tracing to calculate output beam characteristics and intensities. The results corresponding to lasers in the 13.9 nm line of Ni-like Ag and the 32.6 nm and 30.1 nm of Ne-like Ti are discussed in comparison with experiments. Work supported by the NSF EUV ERC, Award EEC-0310717.

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Jorge Rocca
NSF ERC for Extreme Ultraviolet Science and Technology, Colorado State University

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