Abstract Submitted
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Kinetics of the Electron Beam Driven Ar-Xe Laser on NRL's Electra Generator[1] J.P. APRUZESE, J.L. GIULIANI, M.F. WOLFORD, A. DASGUPTA, G.M. PETROV, J.D. SETHIAN, D.D. HINSHELWOOD, M.C. MYERS, Naval Research Laboratory, F. HEGELER, Commonwealth Technologies, Inc., TS. PETROVA, Berkeley Research Associates — Due to its efficiency and potentially high power, the Ar-Xe IR laser (1.733 microns) has been the subject of investigation by several groups around the world since the 1980's. Nonetheless, there is still no clear resolution of some of the key physics and kinetics issues that affect its properties. We are addressing these issues in a coordinated program of experiments and modeling at the Naval Research Laboratory. For our experiments we employ NRL's Electra facility, with its extensive suite of diagnostics, developed as a KrF UV laser for the Department of Energy's High Average Laser Power program. We present results showing that Xe_2^+ as well as $ArXe^+$ significantly contributes to the pumping of the laser, and that dissociation of $ArXe^+$ accounts for most of the laser's temperature sensitivity. We have also found that for an amplifier with dimensions 30 x 30 x 100 cm, the optimum e-beam power deposition density is 50-100 kW/cc for the 140 nanosecond Electra diode pulse.

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