

Abstract Submitted
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KrF Laser Amplification in the Multi-Staged Electra Facility¹ J. GIULIANI, M. WOLFORD, M. MYERS, J. SETHIAN, Naval Research Laboratory, F. HEGELER, CTI, P. BURNS, RSI, R. JAYNES, SAIC — Electra is a rep-rated, e-beam pumped KrF laser system at the Naval Research Laboratory investigating the physics and technology required for inertial fusion energy. To date the main cell has operated as an oscillator and achieved ~ 1.5 kW at 5 Hz for 2000 shots and at 2.5 Hz for over 22,000 shots. The next step is to convert Electra into an amplifier system. A commercial KrF discharge oscillator will provide the initiating laser pulse. This pulse is then sequentially amplified through a preamp in a single pass, followed by a double pass through the main amp. The final system output laser energy depends upon the e-beam pumping power in each amp. To examine this dependency the KrF kinetics/laser simulation code Orestes has been used to follow the growth of the low energy oscillator pulse as it sequentially propagates through the two amplifiers. In addition to the energy, the final output laser pulse shape is a complex product of the amplification and timing between the multiplexed laser pulses and the e-beam pulsed power. Simulations for the preamp have demonstrated partial agreement with the profiles and provide a test of the molecular/plasma kinetic processes used in Orestes.

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John Giuliani
Naval Research Laboratory

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