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Demonstration of a high brightness injection-seeded soft x-ray laser amplifier using a dense plasma[1] EDUARDO GRANADOS, YONG WANG, MIGUEL A. LAROTONDA, MARK BERRILL, BRAD M. LUTHER, DINESH PATEL, CARMEN S. MENONI, JORGE J. ROCCA, Colorado State University — There is a great interest in the generation of high brightness beams of soft x-ray light. We have conducted a table-top experiment in which we have demonstrated the generation of an intense soft x-ray laser beam by saturated amplification of high harmonic seed pulses in a dense transient collisional soft x-ray laser plasma amplifier created by heating a solid titanium target. Amplification of the seed pulses in the 32.6 nm line of Ne-like Ti generates laser pulses of sub-picosecond duration that are measured to approach full spatial coherence. The peak spectral brightness is estimated to be $\sim 2\times10^{26}$ photons/(s mm^2 mrad^2 0.01% bandwidth). The scheme is scalable to produce extremely bright lasers at very short wavelength with full temporal and spatial coherence for applications.

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