

Abstract Submitted
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Demonstration of a desk-top size high repetition rate soft x-ray laser based on a fast capillary discharge¹ SCOTT HEINBUCH, MICHAEL GRISHAM, DALE MARTZ, FONG DENG, ELLIOT BERNSTEIN, JORGE ROCCA, Colorado State University — The demonstration of laser amplification in transitions of Ne-like ions in a capillary discharge plasma column opened the possibility to develop very compact short wavelength lasers for applications. We report a new type of high repetition rate 46.9 nm Ne-like Ar capillary discharge laser that fits on top of a small desk and that it does not require a Marx generator for its excitation [1]. The relatively low voltage required for its operation allows a reduction of nearly one order of magnitude in the size of the pulsed power unit relative to previous capillary discharge lasers. Laser pulses with an energy of $\sim 13 \mu\text{J}$ are generated at repetition rates up to 12 Hz. About $(2-3) \times 10^4$ laser shots can be generated with a single capillary. This new type of portable laser is an easily accessible source of intense short wavelength laser light for applications. Work supported by the NSF EUV ERC and DOE.

[1] S. Heinbuch, M. Grisham, D. Martz and J.J. Rocca. Optics Express, **13**, 4050 (2005).

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