

Abstract Submitted
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Extreme ultraviolet capillary discharge lasers SARAH WILSON, ANDREW WEST, GREG TALLENTS, Univ of York — An extreme ultraviolet capillary discharge laser has recently been installed at the University of York. The laser produces EUV radiation of wavelength 46.9nm, with pulse durations of approximately 1.2ns and energies of up to 50 μ J. A population inversion is produced by a high voltage electrical discharge passing through an argon filled capillary tube. Within the capillary, radial pinching of the argon plasma through $\mathbf{J}\times\mathbf{B}$ force causes the pressure and temperature of the plasma to increase which causes amplification between 3p -3s ($J= 0-1$) transitions producing EUV radiation. Laser optimisation, calibration of detectors and designs for initial experiments to produce warm dense matter by focusing onto solid targets are presented. The plasmas formed by the EUV laser irradiation of solid targets can be shown to produce warm dense matter in a regime where the ionization equilibrium is dominated by radiative ionization.

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