

High Intensity VUV and XUV Generation by Noncollinear Phasematching in Laser Vaporized Media

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Abstract

A method is described for generating intense pulsed vacuum ultraviolet (VUV) and extreme ultraviolet (XUV) laser radiation by resonance enhanced four wave mixing of commercial pulsed nanosecond lasers in laser vaporized mercury at room temperature. Using noncollinear phasematching, the need of dispersive elements such as gratings for separating the VUV/XUV from the residual UV and visible lasers is eliminated. The measured VUV pulse intensities range from 3×10^{12} photons/pulse for $\lambda = 125$ nm to 10^8 photons/pulse at $\lambda = 89.6$ nm. A simple and convenient scheme for generating wavelengths at 125 nm, 112 nm, and 104 nm light (10 eV, 11 eV, and 12 eV) is described.

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