

## Abstract

### **XUV emission from highly ionized plasmas of 2<sup>nd</sup> transition row elements, irradiated by Q-switched Nd doped YAG lasers.**

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XUV emission in the spectral range from 2.3- to 12 nm from plasmas of several 2<sup>nd</sup> transition elements (Y, Zr, Nb, Mo, Ru, Rh and Pd) produced by 600mJ/7ns and 330mJ/170ps Nd:YAG lasers were recorded with a flat field grazing incidence spectrometer equipped with a variable groove spaced grating. The variation of the resulting spectra with laser irradiance was also investigated. The spectra were analysed, with a special emphasis placed on explaining the unresolved transition arrays (UTA) [1] that were found in the 2.3-8 nm region and appear at high power densities. We compare our results to those from previous work and also used atomic structure calculations [2] to identify a number of new features. We obtained an electron temperature with the aid of the Collisional Radiative model [3] for all relevant elements to derive ion populations as a function of the experimental power densities used with the intent to increase conversion efficiency (CE) and spectral purity within this wavelength region.

[1] J Bauche *et al* 1988 *Phys. Scr.* **37** 6592

[2] Cowan R D 1991 *The Theory of Atomic Structure and Spectra* (Berkeley, CA: University of California Press)

[3] Colombant D and Tonon G F 1973 *J. Appl. Phys.* **44** 3524

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