

Angle-resolved absolute out-of-band radiation studies of tin-based laser-produced plasma sources.

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Out-of-band (OOB) radiation has been measured from a laser plasma EUV source formed on a solid tin planar target for a range of angles between 20 and 90 degrees to the target normal. The measurements were made over six spectral bands centered between 200 and 1000 nm. The plasma was formed in a custom made chamber which facilitated target rotation with respect to a diode/filter combination, which acted as an OOB detector. The laser power density was set so as to yield the optimum in-band radiation at 13.5 nm. The plasma OOB emission was found to be dominated by the radiation in the band centered on 214 nm, and a significant contribution from scattered Nd:YAG laser light was observed. The data was analyzed using an $I(\theta) \propto \cos^\alpha(\theta)$ approximation with a value for α of 0.229 ± 0.022 and a correlation coefficient of 0.99 with the experimental data recorded.

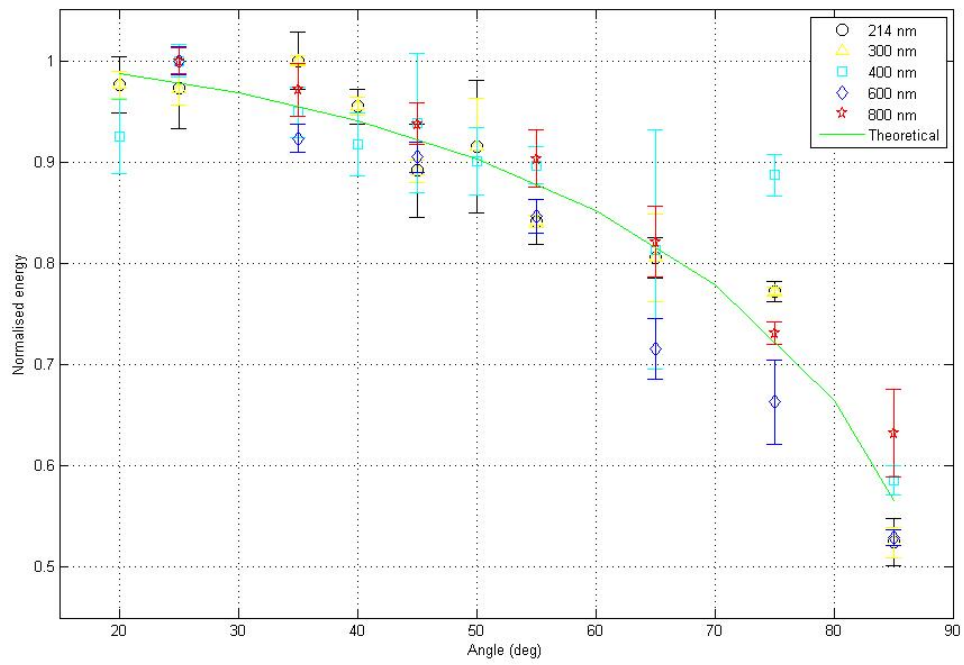


Fig 1: Angular distribution of normalised energies for the bands centred at 214, 300, 400, 600 and 800 nm, including the $I(\theta) \propto \cos^\alpha(\theta)$ approximation.