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|  | [Particle reduction in pulsed laser deposited films using bi-directional ablation](https://www.european-mrs.com/photon-assisted-synthesis-and-processing-materials-nano-microscale-emrs" \l "collapse6)  Authors : Robert W Eason, James A Grant-Jacob, Jake J Prentice, Sergey V Kurilchik, Jacob I Mackenzie. Affiliations : Optoelectronics Research Centre, University of Southampton, Highfield, Southampton, SO171BJ, UK  Abstract: The quality of pulsed laser deposited (PLD) films can suffer from the undesirable incorporation of particulates within the growing film that can originate from the build-up of cones and other surface features on the target surface during ablation. After repetitive exposure to the incident laser pulses, tips of these cones can detach and become embedded in the film, leading to micron-scale defects which are problematic for the growth of high quality single crystalline optical waveguides. The cones formed on the target surface point towards the incident laser direction, and hence a PLD set-up is needed where there is no unique direction of incidence on the target, which should theoretically reduce or ideally eliminate any cone build-up and subsequent problems of particulate generation. We are currently implementing a target geometry where regions are ablated sequentially from equal and opposite angles about the target normal via a bespoke rotation and translation protocol intended to prevent cone formation. Our premise is that such a symmetry-breaking irradiation format away from a purely rotational motion of the target has no preferred overall direction, hence there can be no preferential direction for cone growth. We will present our results that quantify the reduction of particulates within PLD-grown films, using this novel procedure which is intended to further improve the quality, in terms of reduced optical loss, of our ~ 10 µm-thick optical waveguides.  Presented at:  EMRS : European Materials Research Society Spring Meeting  Strasbourg  June 18-22 2018  Strasbourg Convention Centre, Strasbourg, France  Paper X11.2. |