Abstract Submitted
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Dynamics of laser ablative shock waves from one dimensional periodic structured surfaces[1] PREM KIRAN PATURI, LEELA CHELIKANI[2], VENKATESHWARLU PINNOJU, ACRHEM, University of Hyderabad, ACRHEM TEAM — Spatio-temporal evolution of Laser ablative shock waves (LASWs) from one dimensional periodic structured surfaces (1D-PSS) of Aluminum is studied using time resolved defocused shadowgraphy technique. LASWs are generated by focusing 7 ns pulses from second harmonic of Nd:YAG (532 nm, 10 Hz) laser on to 1D-PSS with sinusoidal and triangular modulations of varying periodicity. An expanded He-Ne laser (632.8nm) is used as probe beam for shadowgraphy. Evolution of ablative shock front (SF) with 1.5 ns temporal resolution is used to measure position of the SF, its nature, density and pressure behind the SF. The effect of surface modulation on the LASW and contact front dynamics was compared to those from a flat surface (FS) of Aluminum. SWs from FS and PSS obeyed Taylor's solution for spherical and planar nature, respectively. The velocity of SF from 1D PSS had a twofold increase compared to the FS. This was further enhanced for structures whose periodicity is of the order of excitation wavelength. Variation of SF properties with varying periodicity over a range of 3.3 μm to 0.55 μm has the potential to tailor shockwaves of required parameters.

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[2]The work submitted is part of Ph.D. thesis of Ms. Leela Chelikani

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