

Abstract Submitted
for the SHOCK11 Meeting of
The American Physical Society

Surface chemical reaction of laser ablated aluminum sample for detonation initiation¹ JACK YOH, CHANG-HWAN KIM, ARDIAN GOJANI, Seoul National University — We explore the evolution of metal plasma generated by high laser irradiances and its effect on the surrounding air by using shadowgraph images after laser pulse termination; hence the formation of laser supported detonation and combustion processes has been investigated. The essence of the paper is in observing initiation of chemical reaction between ablated aluminum plasma and oxygen from air by inducing high power laser pulse (>1000 mJ/pulse) and conduct a quantitative comparison of chemically reactive laser initiated waves with the classical detonation of exploding aluminum (dust) cloud in air. Findings in this work may lead to a new method of initiating detonation from metal sample in its bulk form without the need of mixing nano-particles with oxygen for initiation.

¹Authors thank the financial support from the National Research Foundation of Korea (2009, 2010).

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Date submitted: 18 Feb 2011

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