

**OPTIMIZATION OF THE NANO-SECOND PULSED LASER ABLATION PROCESS  
USING FINITE ELEMENT ANALYSIS**

**Jaeveol Lee<sup>1</sup> and Jeonghoon Yoo<sup>2</sup>**

<sup>1</sup> Graduate School of Mechanical Engineering, Yonsei University, Seoul, Korea, leedream77@yonsei.ac.kr

<sup>2</sup> School of Mechanical Engineering, Yonsei University, Korea, Seoul, yoojh@yonsei.ac.kr

**1. Abstract**

We try to simulate the ablation process using nano-second pulsed laser. In case of ablation by the nano-second pulsed lasers, the energy transfer process is similar to the general heat transfer process, so the process can be simulated by the basic heat conduction theory. We have performed the finite element analysis in various cases and compared results with pre-existing experiments qualitatively for process parameters such as laser fluence, pulse width and beam spot size. To control the ablation process as desired, the relation between results such as ablation depth, width or efficiency and process parameters should be verified. Finally, the optimized process condition is obtained using the design of experiment (DOE) and response surface methodology (RSM).