

Optimizing And Improving The Intensity Flux In A Reflective Type Laser Focusing System

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Abstract

Abstract. A Laser Focusing system (LFS) focuses a single laser beam (single Channel) or multiple laser beams (multi - channel) onto a surface (Specimen). The general motive of a LFS is to focus a train of brief pulses or a continuous beam of light onto a Specimen which heats up its surface. In a Reflective type LFS, there is a small focal shift from the geometric focus point when the Laser Source feed is placed at an offset from the Optical Axis of the Mirrors [1]. Aim of this paper is to optimize and improve the Directivity of the Reflective based LFS by shifting the high - tapered feed axially away from the Reflector, so that the Specimen can be heated up expeditiously. This focal shift phenomenon was also verified with some theoretical calculations and the same was observed in the simulation. A 3D model of the LFS was modelled, meshed and analyzed using COMSOL. The Simulation yields a reduction in the size of the heat spot on the Specimen after implementing the algorithm. This Algorithm is yet to be implemented and validated in Real-time.

Figures used in the abstract

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Figure 1 : Improved ray density with algorithm