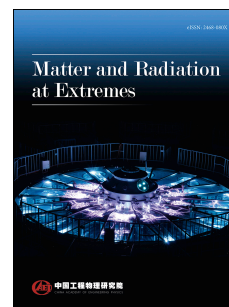


Accepted Manuscript

Optimization of laser illumination configuration for directly driven inertial confinement fusion

M. Murakami, D. Nishi



PII: S2468-080X(16)30125-X

DOI: [10.1016/j.mre.2016.12.002](https://doi.org/10.1016/j.mre.2016.12.002)

Reference: MRE 41

To appear in: *Matter and Radiation at Extremes*

Received Date: 12 July 2016

Revised Date: 5 October 2016

Accepted Date: 25 October 2016

Please cite this article as: M. Murakami, D. Nishi, Optimization of laser illumination configuration for directly driven inertial confinement fusion, *Matter and Radiation at Extremes* (2017), doi: 10.1016/j.mre.2016.12.002.

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

Optimization of laser illumination configuration for directly driven inertial confinement fusion

M. Murakami^{1,*} and D. Nishi¹

¹*Institute of Laser Engineering, Osaka University, Osaka 565-0871, Japan*

(Dated: December 21, 2016)

Abstract

Optimum laser configurations are presented to achieve high illumination uniformity with directly driven inertial confinement fusion targets. Assuming axisymmetric absorption pattern of individual laser beams, theoretical models are reviewed in terms of the number of laser beams, system imperfection, and laser beam patterns. Utilizing a self-organizing system of charged particles on a sphere, a simple numerical model is provided to give an optimal configuration for an arbitrary number of laser beams. As a result, such new configurations as "M48" and "M60" are found to show substantially higher illumination uniformity than any other existing direct drive systems. A new polar direct-drive scheme is proposed with the laser axes keeping off the target center, which can be applied to laser configurations designed for indirectly driven inertial fusion.

PACS numbers: 28.52.Av, 52.57.Bc, 52.57.-z

Keywords: analytical model, laser illumination design, polar direct drive

*Electronic address: murakami-m@ile.osaka-u.ac.jp

Download English Version:

<https://daneshyari.com/en/article/5477749>

Download Persian Version:

<https://daneshyari.com/article/5477749>

[Daneshyari.com](https://daneshyari.com)