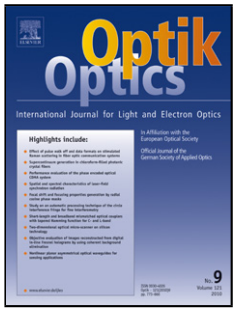
Accepted Manuscript



Title: A high strength magnesium alloy-based rotating mirror for an ultra-high speed camera

Authors: Chunbo Li, Hongbin Huang, Junqing Zhao, Shuangchen Ruan

PII: S0030-4026(17)31059-8
DOI: http://dx.doi.org/10.1016/j.ijleo.2017.09.007
Reference: IJLEO 59615

To appear in:

Received date: 14-5-2017
Accepted date: 2-9-2017

Please cite this article as: Chunbo Li, Hongbin Huang, Junqing Zhao, Shuangchen Ruan, A high strength magnesium alloy-based rotating mirror for an ultra-high speed camera, Optik - International Journal for Light and Electron Opticshttp://dx.doi.org/10.1016/j.ijleo.2017.09.007

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.

A high strength magnesium alloy-based rotating mirror for an ultra-high speed camera

Chunbo Li,[a,b,c] Hongbin Huang,[c] Junqing Zhao,[d] Shuangchen Ruan,[a,b,*]

[a] Shenzhen Key Laboratory of Laser Engineering, College of Optoelectronic Engineering, Shenzhen University, Shenzhen 518060, China

[b] Key Laboratory of Optoelectronic Devices and Systems of Ministry of Education and Guangdong Province, Shenzhen University, Shenzhen 518060, China

[c] College of Mechanic and Control Engineering, Shenzhen University, Shenzhen 518060, China

[d] Jiangsu Key Laboratory of Advanced Laser Materials and Devices, School of Physics and Electronic Engineering, Jiangsu Normal University, Xuzhou 221116, China

*Corresponding Author

E-mail address: scruan@szu.edu.cn

Abstract: We theoretically and numerically studied the properties of a high-strength magnesium alloy rotating mirror (Mg-RM) as a novel potential candidate for an ultra-high speed camera. The maximum lateral deformation of the Mg-RM was reduced to 0.92 times that of a high-strength aluminium alloy rotating mirror (Al-RM) at a rotating speed of 5×10^5 revolutions per minute (rpm). Meanwhile, compared to the Al-RM, the limit edge linear velocity of the Mg-RM was improved by 1.11 times, indicating that the limit time resolution could be improved by 11% when used for an ultra-high speed camera. According to our theoretical and numerical investigations, the remarkable properties of the Mg-RM, indicate that the high-strength magnesium alloy is another ideal and novel RM material for ultra-high speed cameras.

Keywords: optomechanical design; ultra-high speed camera; optical devices; rotating mirror

Download English Version:

https://daneshyari.com/en/article/7224539

Download Persian Version:

https://daneshyari.com/article/7224539

Daneshyari.com