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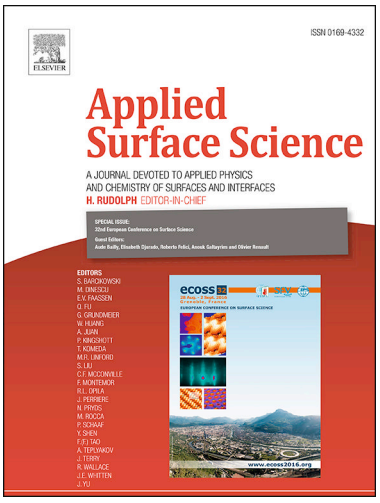

Full Length Article

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Vinod Parmar, Yung C. Shin

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Wideband Anti-Reflective Silicon Surface Structures Fabricated by Femtosecond Laser Texturing

Vinod Parmar and Yung C. Shin[1]

Center for Laser-based Manufacturing,
School of Mechanical Engineering,
Purdue University, West Lafayette, IN 47906, USA

Abstract:

In this study, the effects of laser fluence, scanning speed and texturing environment on reflectance of femtosecond laser textured silicon substrate are investigated. Microstructural analysis revealed the cause of variation of average reflectance with laser fluence and scanning speed. The densely packed flat surface structures are less efficient in trapping the light, thus exhibiting higher reflectance, while sparsely packed microstructures trap the incident light and lead to very low reflectance. The study also explores the effect of texturing media, wherein femtosecond laser texturing lead to formation of globular and elongated structures in air and water respectively. In advancement to previously reported results, this study demonstrates a wideband antireflection property of silicon substrate textured at an optimized condition.

Keywords:

[1] Corresponding author: shin@purdue.edu, 1-765-494-9775 (ph), 1+765-494-0539 (fax)