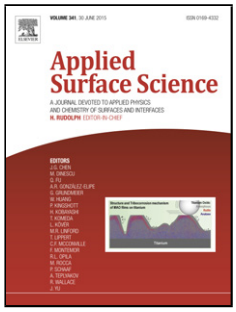

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Modulations of anisotropic optical transmission on alumina-doped zinc oxide surface by femtosecond laser induced ripples

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Highlights:

- Large area and uniform ripples were fabricated on the alumina-doped zinc oxide surface induced by femtosecond laser.
- Ripples exhibit transmission anisotropic for polarized light of different directions.
- Ripples induced at high laser fluence lost the original absorption properties of the material.
- By improving the uniformity, spatial interval, and depth of the structures can increase the able of transmission anisotropic.

Abstract

This study demonstrated that femtosecond-laser-induced ripples on an alumina-doped zinc oxide (AZO) film with space intervals of approximately 340 and 660 nm exhibit modulations of anisotropic optical transmission. At low laser fluence, ripples can't affect the original absorption peak of AZO film, but at higher laser fluence, the absorption peak of AZO film is disappeared due to the modulation by femtosecond laser induced ripples. Moreover, the relationship between the anisotropic optical transmission and the features of nanostructures is