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Study on Fabrication of Surface Functional Micro and Nanostructures by Femtosecond Laser

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Abstract : The functional micro and nanostructures, which can endow material surface with unique properties such as super-absorptance, hydrophobic and drag reduction. Recently, femtosecond laser ablation has been demonstrated to be a promising technology for surface functional micro and nanostructures fabrication. In this paper, using femtosecond laser ablation processing technique, we fabricated functional micro and nanostructures on Ti and Al alloy surfaces, test results showed that processed surfaces have 82%~96% absorptance over a broad wavelength range from ultraviolet to infrared. The surface function properties, which determined by micro and nanostructures, could be modulated by variation laser parameters. These functional surfaces may find applications in such areas as photonics, plasmonics, spaceborne devices, thermal radiation sources, solar energy absorbers and biomedicine.

Keywords : surface functional, micro and nanostructures, femtosecond laser, ablation
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