

Holographic Fabrication of 3D Nanostructures for Optofluidic Integration

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Multi-dimensionally fabricated microstructures inside microchannels are of great importance for microfluidic mixing, microscale separation of biological materials, chemical microsensors, and microfluidic control of light such as optical waveguides. Although the methods based on colloidal self-assembly are able to produce high quality three-dimensional photonic nanostructures without machinery, practical application of self-assembling strategy has been limited because it takes a long process time with extremely limited controllability compared with the conventional lithographic technique.

In this study, we reported new strategy by integrating holographic lithography with photolithography for hybrid patterns of microchannels with built-in 3D photonic nanostructures. Microchannels were created by photolithography and photonic nanostructures were fabricated by holographic lithography.