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标题: Rapid fabrication of 3D terahertz split ring resonator arrays by novel single-shot direct write focused proximity field nanopatterning
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摘要: For the next generation of phoXonic, plasmonic, opto-mechanical and microfluidic devices, the capability to create 3D microstructures is highly desirable. Fabrication of such structures by conventional top-down techniques generally requires multiple time-consuming steps and is limited in the ability to define features spanning multiple layers at prescribed angles. 3D direct write lithography (3DDW) has the capability to draw nearly arbitrary structures, but is an inherently slow serial writing process. Here we present a method, denoted focused proximity field nanopatterning (FPnP), that combines 3DDW with single or multiphoton interference lithography (IL). By exposing a thick photoresist layer having a phase mask pattern imprinted on its surface with a tightly focused laser beam, we produce locally unique complex structures. The morphology can be varied based on beam and mask parameters. Patterns may be written rapidly in a single shot mode with arbitrary positions defined by the direct write, thus exploiting the control of 3DDW with the enhanced speed of phase mask IL. Here we show the ability for this technique to rapidly produce arrays of "stand-up" far IR resonators. (c) 2012 Optical Society of America
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