Merging Metamaterial and Optical Fiber Technologies

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Abstract- We will review recent advances in metamaterials research directed towards the development of switchable and tunable functional nanostructures. Metamaterials research has migrated from the study of exclusively metallic plasmonic structures to embraces a large variety of advanced material platforms, including dielectrics, semiconductors, superconductors, topological insulators and complex hybrid systems. We will discuss coherent control of metasurfaces, all-optical and electro-optical switching with reconfigurable nano-opto-mechanical and phase-change metamaterials and ways in which functional metamaterials can be integrated with optical fiber platforms.