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Development of Metamaterial Structures by Laser Direct-Write[1]
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The use of metamaterials structures has been the subject of extensive discussions given their wide range of applications. However, a large fraction of the work available to date has been limited to simulations and proof-of-principle demonstrations. One reason for the limited success inserting these structures into functioning systems and real-world applications is the high level of complexity involved in their fabrication. Direct-write processes are ideally suited for the fabrication of arbitrary periodic and aperiodic structures found in most metamaterial and plasmonic designs. For these applications, laser-based processes offer numerous advantages since they can be applied to virtually any surface over a wide range of scales. Furthermore, laser direct-write or LDW allows the precise deposition and/or removal of material thus enabling the fabrication of novel metamaterial designs. This presentation will show examples of metamaterial and plasmonic structures developed at the Naval Research Lab using LDW, and discuss the benefits of laser processing for these applications.

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