

Abstract Submitted
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Percolation and polaritonic effects in periodic planar nanostructures evolving from holes to islands¹ YUN PENG, TRILOCHAN PAUDEL, WEN-CHEN CHEN, WILLIE PADILLA, ZHIFENG REN, Boston College, KRIS KEMPER, Boston College, South China Normal University — We study interaction of the electromagnetic radiation with a series of thin film periodic nanostructures evolving from holes to islands. We show, through model calculations, simulations and experiments, that the responses of these structures evolve accordingly, with two topologically distinct spectral types for holes and islands. We find also, that the response at the transitional pattern is singular. We show that the corresponding effective dielectric function follows the critical behavior predicted by the percolation theory, and thus the hole-to-island structural evolution in this series is a topological analog of the percolation problem, with the percolation threshold at the transitional pattern.

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