Topological photonics at microwave frequencies

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The discovery of topological insulator inspires the pursuit of creating a range of new properties in photonics applying topology. By carefully designing the coupling between resonators, one can achieve topologically non-trivial band structures on demand. We present a series of studies on coupled split ring resonators, from orientation-tunable coupling, topological features in one-dimensional models, and transmission via localized edge modes. Combined with artificial atoms, the system may provide an ideal testing ground for the interaction between atom and topological photons. Simulations on interacting particles can also be realized using non-linear resonators.