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Disorder induced Floquet Topological Insulators PARAJ BHATTACHARJEE, NETANEL LINDNER, California Institute of Technology, Pasadena, California 91125, USA, MIKAEL RECHTSMAN, Technion - Israel Institute of Technology, Haifa 32000, Israel, GIL REFAEL, California Institute of Technology, Pasadena, California 91125, USA — We investigate the possibility of realizing a disorder induced topological state in two dimensional periodically driven systems. This phenomenon is akin to the topological Anderson insulator (TAI) in equilibrium systems. We focus on graphene band structures, where in the presence of the driving electromagnetic field, but in the absence of disorder, the system starts off in a trivial state due to the presence of a sublattice potential. We show that by adding on-site disorder a topological state is induced in this system. We numerically compute the average Bott index (the analog of the Chern number for disordered systems) to show that starting from a trivial phase, topological behavior can be observed at finite disorder strength. In the topological phase, we detect chiral edge states by a numerical time evolution of wavepackets at the edge of the system. We propose an experimental set-up in photonic lattices to observe this phenomenon.

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