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**Floquet Topological Insulator in Semiconductor Quantum Wells**

NETANEL LINDNER, GIL REFAEL, California Institute of Technology, VICTOR GALITSKI, University of Maryland — Topological phase transitions between a conventional insulator and a state of matter with topological properties have been proposed and observed in mercury telluride - cadmium telluride quantum wells. We show that a topological state can be induced in such a device, initially in the trivial phase, by irradiation with microwave frequencies, without closing the gap and crossing the phase transition. We show that the quasi-energy spectrum exhibits a single pair of helical edge states. The velocity of the edge states can be tuned by adjusting the intensity of the microwave radiation. We discuss the necessary experimental parameters for our proposal. This proposal provides an example and a proof of principle of a new non-equilibrium topological state, Floquet topological insulator, introduced in this paper. arXiv:1008.1792

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