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Entanglement properties of Floquet Chern insulators[1] DANIEL YATES, YONAH LEMONIK, ADITI MITRA, New York University — Results are presented for the entanglement entropy and spectrum of half-filled graphene following the switch on of a circularly polarized laser. The laser parameters are chosen to correspond to several different Floquet Chern insulator phases. The entanglement properties of the unitarily evolved wavefunctions are compared with the state where one of the Floquet bands is completely occupied. The true states show a volume law for the entanglement, whereas the Floquet states show an area law. Qualitative differences are found in the entanglement properties of the off-resonant and on-resonant laser. Edge states are found in the entanglement spectrum corresponding to certain physical edge states expected in a Chern insulator. However, some edge states that would be expected from the Floquet band structure are missing from the entanglement spectrum. An analytic theory is developed for the long time structure of the entanglement spectrum. It is argued that only edge states corresponding to off-resonant processes appear in the entanglement spectrum.

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