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Chern and Majorana modes of quasiperiodic systems GERARDO NAUMIS[1], Instituto de Física, Universidad Nacional Autónoma de México (UNAM), INDUBALA SATIJA[2], George Mason University, USA — In this work, we investigate the self-similar states found in quasiperiodic systems characterized by topological invariants–the Chern numbers. We show that the topology introduces a competing length in the self-similar band edge states transforming peaks into doublets of size equal to the Chern number [1]. This length intertwines with quasiperiodicity and introduces an intrinsic scale, producing Chern beats related to Friedel oscillations. An explanation based on Thouless equations for band edge modes of the Harper equation is provided to understand the Chern dressing of the fractal spectrum. Chern numbers also influence the zero-energy mode that, for quasiperiodic systems, is related to the Majorana modes: the remnant of the edge localized topological state that delocalizes at the onset to a topological transition. In superconducting wires, the exponentially decaying profile of the edge localized Majorana modes also encode fingerprints of the Chern states that reside in close proximity to zero energy.

[1] I. Satija, G.G. Naumis, "Chern and Majorana modes in Quasicrystals," Phys. Rev. B 88, 054204 (2013).

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