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EDUARDO BARRIOS: Laser-induced boundary states in graphite

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The common classification of the electronic phases (insulator, semiconductor, semimetal, and metal) of the matter is based on spectral properties. However, the discovery of the topological insulators (TI) added a new kind of classification based on topological information carried by the eigenstates of the system. A topological insulator is a material that behaves as an insulator in the bulk and hosts conducting surface states, these surface states are like highways for electrons. The conducting surface states are weakly affected by the disorder which is an attractive characteristic for applications. One way to induce topological electronic phases in common materials is by using laser illumination [1-4]. The illuminated material may host a topological state, a phase commonly known as Floquet topological insulator [4]. In this work, we explore laser-induced effects in graphite, where we find topological boundary states, these states propagate mainly along the borders. The topological states present a 'skeleton' in the reciprocal space.

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