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Interplay of imperfections and surface states in topological crystalline insulators EVGENY PLEKHANOV, CEDRIC WEBER, Kings College, London — The conducting states, recently discovered at the surface of a special class of insulators topological insulators - are distinguished for their insensitivity to local and non-magnetic surface defects. Their behavior in the presence of magnetic impurities and macroscopic imperfections of the surface is puzzling and hard to analyze quantitatively. Here, we present a systematic study of the imperfections (magnetic impurities and deviations from perfect surface cleavage) in topological crystalline insulators of the tin telluride family by using realistic first-principles-derived tight-binding models. The theoretical framework proposed is quite general and easily permits the extensions to other TI families and impurity types. The influence of the strong local correlations of the impurity atoms on the topological states stability is also discussed within the frame of the Dynamical Mean Field Theory.

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