

Band Flattening and Overlap Fermion

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We show that, for each symmetry class based on the tenfold way classification of topological insulators/superconductors, the effective Dirac operator obtained by integrating out the additional bulk direction takes a value in the corresponding classifying space, from which we obtain the flat band Hamiltonian. We then obtain the overlap Dirac operator for each symmetry class and establish the Ginsparg-Wilson relation associated with C and T symmetries, and also the mod-two index theorem.

Primary author: KIMURA, Taro (Université de Bourgogne)

Presenter: KIMURA, Taro (Université de Bourgogne)