Bounded States in the Continuum: Chiral Lattices and Van Hove Singularities

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We present two different mechanisms for the formation of bounded states in the continuum in lattices with Van Hove singularities and/or chiral symmetry connected to leads. Bounded states in the continuum are square integrable solutions of the time-independent Schrödinger equation with eigenenergies above the potential threshold. We derive some algebraic rules for the number of states that remain bounded depending on the dimensionality and rank of the system Hamiltonian including the coupling to the leads. We study the transport properties of some relevant physical examples and propose different experiments for measuring the consequences of the presence of these bounded states in the continuum.

[1] V. Fernández-Hurtado, J. Mur-Petet, J.J. García-Ripoll, R.A. Molina, New J. Phys. 16, 035005 (2014).
[2] J. Mur-Petit, R.A. Molina, submitted.