Super-Klein tunneling of Dirac fermions through electrostatic gratings in graphene

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Abstract

We use the Wick-rotated time-dependent supersymmetry to construct models of two-dimensional Dirac fermions in presence of an electrostatic grating. We show that there appears omnidirectional perfect transmission through the grating at specific energy. Additionally to being transparent for incoming fermions, the grating hosts strongly localized states.

REFERENCES

[1]   Alonso Contreras-Astorga, Francisco Correa, Vít Jakubský, Phys. Rev. B 102, 115429 (2020)
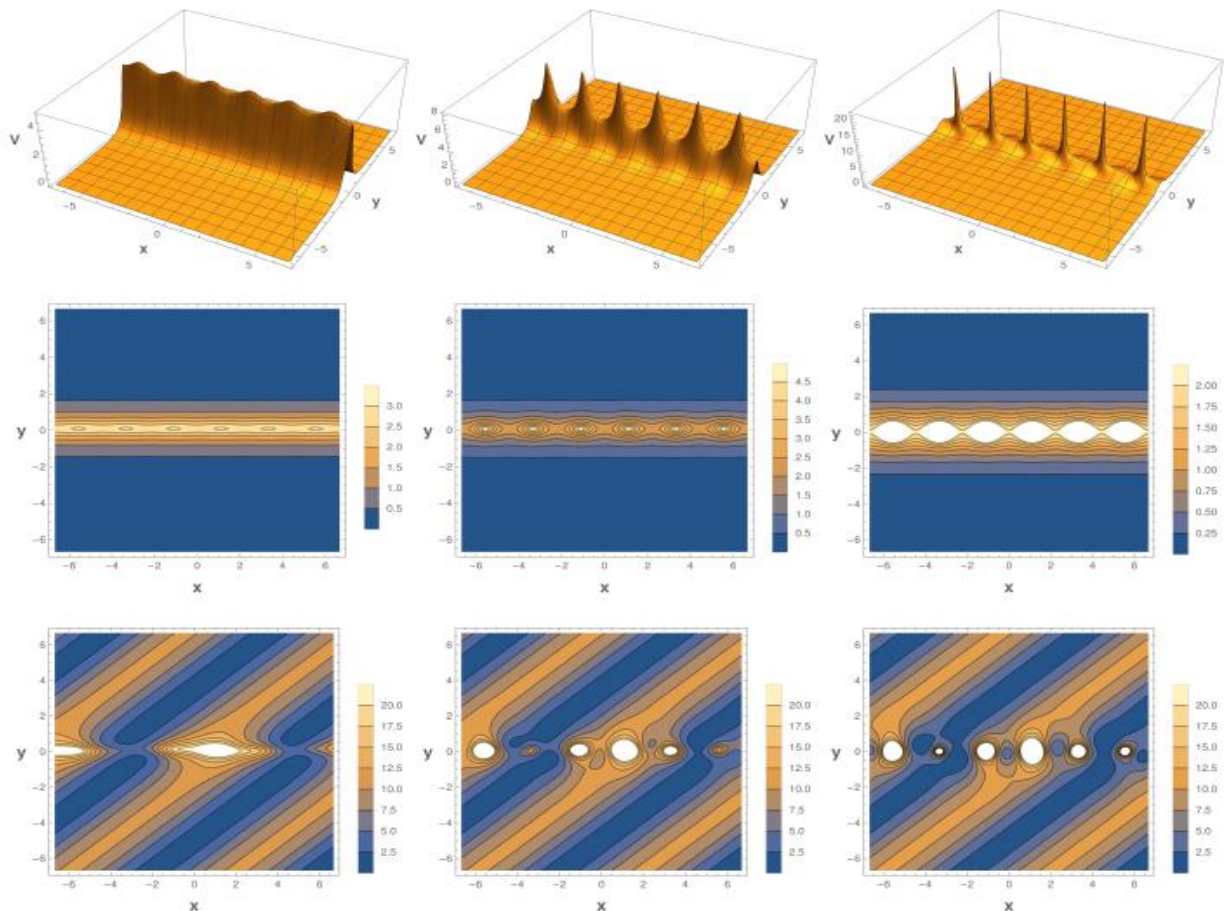
FIGURES

Figure 1: The electrostatic grating (upper row) with density of probability of the confined states (central row) and the density of probability (interference pattern) of a linear combination of the asymptotically plane-waves (lower row). The columns correspond to different choices of the free parameters in the model.

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