
Disorder-induced quantum metric in graphene with vacancies

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Résumé

Random vacancies in a graphene monolayer induce defect states that are known to form a narrow impurity band centered around zero energy at half-filling. In this work (1), we use a space-resolved formulation of the quantum metric and establish a strong enhancement of the electronic correlations in this impurity band. The enhancement is primarily due to strong correlations between pairs of vacancies situated on different sublattices at anomalously large spatial distances. We trace the strong enhancement to both the multifractal vacancy wave functions, which ties the system exactly at the Anderson insulator transition for all defect concentrations, and preserving the chiral symmetry. (1) Quentin Marsal and Annica M. Black-Schaffer, Phys. Rev. Lett. **133**, 026002 (2024)

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