Location effects induced in moiré patterns with noise

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Strictly, all the physical systems present a certain degree of randomness characterized by the presence of noise. When a physical system is in competition with noise, the evolution of the system may induce/generate novel physical properties, an example of this behavior being the generation of localization effects. Mechanism competition is suitably characterized by analyzing the correlation function, it means that the presence of noise generates directionality in the evolution of the physical processes. In this context we describe the evolution of periodical structures when they are perturbed with multiplicative noise. We show that increasing the random character, the structures generate localization when the correlation function takes the form of a decreasing exponential from the physical point of view. As a prototype, we use moiré structures and this analysis is transferred to a plasmonic field propagating trough surface metal thin films. The propagation of plasmonic modes is generated by the coupling of the evanescent behavior.

References

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Preferred mode of presentation: Oral/Poster