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Localization vs. delocalization of waves in circuit QED BRUNO G. TAKETANI, FRANK K. WILHELM, Saarland University — Wave localization in disordered media is an important phenomenon arising from the destructive interference of waves from the many scatterers in the medium. However, interaction between localized modes may counteract this effect and lead to a localization-delocalization transition. Understanding this interplay between disorder and interaction is thus of great importance. We investigate this interplay using quasiperiodic JJAs. This metamaterial possesses degenerate localized modes coexisting with delocalized modes which can be made to interact via the junctions Kerr non-linearity. On the quantum regime, the system presents a natural route to generate photon-photon interaction in circuit QED. The proposed experiment can be readily made with current technologies.

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