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Lattice wave transport in a 2D complex plasma graphene analogue.[1] EVA KOSTADINOVA, CONSTANZE LIAW, LORIN MATTHEWS, KYLE BUSSE, TRUELL HYDE, CASPER - Baylor University — We present a numerical study of Anderson localization in 2D complex plasma crystal. In the classical regime, Anderson localization is the absence of diffusion of certain wave frequencies due to scattering from lattice defects. The appropriate condition for localization is (known as the modified Ioffe-Regel criterion), where is the wavevector and is the mean free path. As , the wave cannot perform even a single oscillation between successive interactions with defects, which eliminates the propagation. Here we examine transport of in-plane lattice waves through a 2D dusty plasma crystal, which is used as a graphene analogue. The lattice disorder is controlled in two ways: i) through variation of particle size (and thus particle density and interparticle separation) and ii) through variation of the radial confinement force. This allows us to compare the transport properties of the crystal in the weak and strong interaction regimes, which provides valuable information on the effects of strong interactions in the crystal.

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