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【136】Experimental Tuning of Transport Regimes in Hyperuniform Disordered Photonic Materials

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Recently, it has been shown that disordered dielectrics can show a photonic band gap in the presence of structural correlations, but 30 years after John's seminal proposal on the interplay between the photonic pseudo band gap in disordered photonic crystals and Anderson localization, a controlled experimental study of the transport properties in between ordered and disordered states is still lacking. In this talk, I present wave transport experiments in hyperuniform disordered arrays of cylinders with high dielectric permittivity. Using microwaves, we show that the same material can display transparency, photon diffusion, Anderson localization, or a full band gap, depending on the frequency of the electromagnetic wave.

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