

Abstract Submitted
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Transverse Light Localization in waveguide arrays with random absorption or amplification¹ A. BASIRI, Wesleyan University, Middletown, CT-06457, USA, Y. BROMBERG, Yale University, New Haven, CT-06520, USA, A. YAMILOV, Missouri University of Science and Technology, Rolla, MO-65409, USA, H. CAO, Yale University, New Haven, CT-06520, USA, T. KOTTOS, Wesleyan University, Middletown, CT-06457, USA — We investigate the possibility to induce transverse localization of light in an array of waveguides with randomness pertaining to the imaginary part of the dielectric constant. Although this new set-up is distinct from the traditional Anderson scenario, where localization emerges due to multiple scattering from a real random potential, we find that disordered amplification/attenuation can also lead to exponential localization. We quantify the degree of localization of the Floquet-Bloch modes of our system via their participation number, which is shown to satisfy a one-parameter scaling theory. The effects of this transverse localization of the normal modes in the paraxial beam propagation are theoretically predicted and confirmed by numerical experiments.

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