

# Unidirectional reflectionless property of periodic structures with $PT$ -symmetry

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Unidirectional reflectionless property is the phenomenon wherein the reflection is zero for an incident wave coming from one side and nonzero for an incident wave coming from the other side [1]. It has been found for many structures such as  $PT$ -symmetric optical fibers, waveguides, coupled resonator systems, etc. In this talk, I will study the unidirectional reflectionless property of 2D structures with 1D periodicity and  $PT$ -symmetry (i.e., with balanced gain and loss). The existence of the unidirectional reflectionless property is proved theoretically by using the  $S$ -matrix and the symmetry. Numerical examples will be presented to show that invisibility can happen by tuning structure parameters such that the phase of the transmitted wave is zero.

## Reference

- [1] Huang, Y., Y. Shen, C. Min, S. Fan, and G. Veronis, 2017: Unidirectional reflectionless light propagation at exceptional points. *Nanophotonics* **6**, 977–996.

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