Abstract

Electromagnetic materials with near-zero refractive index showing many unique properties have attracted considerable attention over the past decade. In this talk, I will talk about the fundamentals and recent advances of zero-index media, especially the effects of inhomogeneity and impurities. I will first talk about the photonic “doping” effect of impurities in zero-index media, based on which, I will show how to use the photonic doping discipline to control the absorption of lights so as to realize geometry-invariant coherent perfect absorption Then, I will talk about a way to break the doping discipline and realize the extraordinary property of impurity-immunity (photonic “anti-doping” effect) by using parity-time symmetry. In this case, the system exhibits the rare property of perfect transmission irrespective of embedded impurities of almost any materials and shapes.

Reference:

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