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Retroreflection from disordered porous semiconductors

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Abstract

Prominent retroreflection is experimentally observed in disordered porous InP membranes. It is believed to be the result of an interplay between Fresnel-like and Bragg-like reflection for different components of an impinging wave vector, mediated by pronounced disorder and high material absorption. Retroreflection is seen to be stronger than Fresnel reflection and visible with the naked eye. The observed effect is broadband in wavelength, present in a wide range of incident angles, and (unique Fresnel reflection) largely polarization independent. It can be of use in a novel design of miniature retroreflecting optical components.

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