Near-Infrared Broad Band Chiral Plasmonic Metasurface Absorbers

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ABSTRACT
Chirality is common and essential in many fields, such as biology, chemistry and physics. Metasurfaces can provide extraordinary optical properties for many promising applications. Here, a new type of near-infrared broadband chiral plasmonic metasurface absorbers based on the combination of several double-rectangle patterns is designed and experimentally demonstrated to achieve large circular dichroism (CD) in a broad wavelength range. The maximum chiral absorption can reach to 0.7 and the average CD is around 0.5 within the operation wavelength range from 1.35 µm to 1.85 µm. The high CD can lead to a local temperature difference of the absorber. The high-contrast reflective infrared images are realized by changing the wavelength and polarization of incident light. The broadband chiral metasurface absorbers promise future applications in many areas such as optical filters, thermal energy harvesting, optical communication, and chiral imaging.

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