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Abstract:An effective negative refractive index (NRI) is demonstrated and experimentally verified for the first two propagation bands of a fishnet-like metamaterial at millimeter-wave frequencies. The dual-band NRI behavior is achieved by engineering the diffraction order (± 1, ± 1) associated with the internal mode supported between holey layers to correspond with the second propagation band. In addition to the experimental interferometric technique that accounts for the handedness of the propagation, numerical results are given to predict the dual-band effective NRI and to confirm dual-band negative refraction for a prism composed of the proposed metamaterial.
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