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Title: Negative refractive index in chiral spiral metamaterials at terahertz frequencies
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Abstract: A three-dimensional chiral metamaterial consisting of arrays of the multi-layered mutually twisted metallic spirals is proposed. We theoretically demonstrate such a chiral spiral structure exhibiting negative refractive index at terahertz frequencies. The chirality with varied refractive index can be obtained by change of configurations of the structure. The presented design offers flexibility for investigation of electromagnetic properties of chiral metamaterials in the terahertz regime and thus leads to a unique route to terahertz device applications.