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Title:Dual-band polarization-independent sub-terahertz fishnet metamaterial

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Abstract:A dual-band and polarization-independent fishnet metamaterial for the sub-THz frequency range is proposed and investigated. Dual-band modes have two resonances in which the first one is fixed as a left-handed mode and the second one can be arranged as a left-handed or single-negative mode. We select the character of second resonance by the choice of substrate properties. The metamaterial features of the structure are analyzed using the scattering data and confirmed by applying Kramers-Kronig relations. The characteristic features are also verified by the current distribution at the inner metallic surfaces of the structure. The influence of substrate modifications is studied and the effect of this change on resonances is discussed. The design of a dual-band and polarization-independent sub-THz metamaterial presented here can serve as a model and guide to realize tunable fishnet metamaterials for other frequency regimes. © 2011 Elsevier B.V. All rights reserved.

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