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Title:A tunable hybrid metamaterial absorber based on vanadium oxide films

Authors:Wen, Q.Y. (1); Zhang, H.W. (1); Yang, Q.H. (1); Chen, Z. (2); Long, Y. (1); Jing, Y.L. (1); Lin, Y. (1); Zhang, P.X. (3)

Author affiliation: (1) Univ Elect Sci & Technol China, State Key Lab Elect Films & Integrated Devices, Chengdu 610054, Peoples R China; (2) Univ Elect Sci & Technol China, Natl Key Lab Sci & Technol Commun, Chengdu 610054, Peoples R China; (3) Univ, Sch Chem & Chem Engn, Shenzhen 518060, Peoples R China

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Abstract:A tunable hybrid metamaterial absorber (MA) in the microwave band was designed, fabricated and characterized. The hybrid MA was realized by incorporating a VO₂ film into the conventional resonant MA. By thermally triggering the insulator-metal phase transition of the VO₂ film, the impedance match condition was broken and a deep amplitude modulation of about 63.3% to the electromagnetic wave absorption was achieved. A moderate blue-shift of the resonance frequency was observed which is promising for practical applications. This VO₂-based MA exhibits many advantages such as strong tunability, frequency agility, simple fabrication and ease of scaling to the terahertz band.

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