

عنوان مقاله:

Metamaterial-Based Ultra-Broadband Polarization Converter with RCS Reduction Capability

محل انتشار:

دومین کنفرانس بین المللی پیشرفت های اخیر در مهندسی، نوآوری و تکنولوژی (سال: 1402)

تعداد صفحات اصل مقاله: 17

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خلاصه مقاله:

In this research, we introduce a structure with high efficiency in polarization conversion and high bandwidth in the terahertz band. The proposed metamaterial consists of two sigma-shaped resonators, one side of which is metal to create the ground plane. The mathematical computations and simulations of the structure demonstrate that the metamaterial surface presented possesses the capacity to convert linearly polarized dry waves within the ۱.۱ to ۴.۸ terahertz range into a cross-polarized wave with a polarization ratio exceeding ۹۱% and a bandwidth of ۹۱%, which can be converted to a decimal. Upon analyzing the outcomes of the simulation, it is observed that the proposed metamaterial is impervious to polarization. Additionally, a model of a metamaterial surface capable of two-bit coding is presented. The calculations and simulations reveal exceptional performance in controlling reflected waves while decreasing the radar cross section in the terahertz band. Specifically, the results manifest a ۱۰ dB reduction of the radar cross section in the ۱.۷ to ۴.۲ THz range, which opens up novel avenues for exploring THz wave manipulation and RCS minimization.

کلمات کلیدی:

RCS, metamaterial, meta surface, radar

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