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Ultra-wideband antipodal Vivaldi antenna for radar and microwave imaging application

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Abstract

In this ultra-wideband antipodal Vivaldi antenna among end fire radiation patterns function at UWB (3.1 GHz to 10.6 GHz) frequency range for radar and microwave imaging application is proposed. This article presents the design of two different types of antipodal Vivaldi antennas, a conventional and a modified antipodal Vivaldi antenna. This paper presents a parametric analysis of each antenna. While designing the proposed antennas, originally a conventional antipodal Vivaldi antenna is presented for a wide impedance bandwidth performance assessment. Furthermore, the Vivaldi antenna is modified by incorporating corrugations on the edges which resulting in gain significantly along with increased directivity in the low frequency band. In addition, the modified antenna offers high gain and flat gain in the operating UWB band. The design and optimization process is carried out using the CST simulation software for parameters performance assessment of return loss, radiation pattern, directivity and input impedance. Prototypes of the two different proposed antennas are fabricated and tested for its return loss and directional pattern. © 2017 IEEE.

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