Abstracts

Enhanced patch-antenna performance by suppressing surface waves using photonic-bandgap substrates

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The microstrip patch antenna is a low-profile robust planar structure. A wide range of radiation patterns can be achieved with this type of antenna and, due to the ease of manufacture, is inexpensive compared with other types of antennas. However, patch-antenna designs have some limitations such as restricted bandwidth of operation, low gain, and a potential decrease in radiation efficiency due to surface-wave losses. In this paper, a photonic-bandgap (PBG) substrate for patch antennas is proposed, which minimizes the surface-wave effects. In order to verify the performance of this kind of substrate, a configuration with a thick substrate is analyzed. The PBG patch antenna shows significantly reduced levels of surface modes compared to conventional patch antennas, thus improving the gain and far-field radiation pattern.

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