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Title: Analysis and design of rectangular microstrip antenna on two-layer substrate materials at terahertz frequency

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Abstract

In this paper, an effective permittivity of the two-layer dielectric substrate material has been analyzed to enhance the electrical performance of the rectangular microstrip patch antenna at terahertz frequency. The frequency dependent effective dielectric permittivity of the substrate materials has been evaluated and result has been compared with finite integral technique based CST Microwave Studio a commercially available simulator. The input impedance characteristic with electrical performance of the rectangular microstrip patch antenna on two-layer substrate materials has also been analyzed at 600 GHz. Manipulation in the input impedance characteristic of the antenna has led to a slow wave structure. This slow wave structure has been examined at 542 GHz, and improvement in the performance has been observed without increasing the overall dimension of the proposed antenna.