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Mutual coupling reduction in an antenna array by using two parasitic microstrips

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This paper presents a new method of reduction mutual coupling. The proposed antenna array operating at 2.4 GHz is comprised of two rectangular patches and two parasitic microstrips, the parasitic microstrips are printed on substrate top layer over two rectangular patches. The measured results indicate that the mutual coupling is greatly suppressed, which becomes to -32 dB from -13.4 dB, and the radiation patterns are practically unaffected, as demonstrated by the comparison of identical antenna arrays with and without parasitic microstrips.

Introduction: In contemporary communication systems, antenna arrays are an important component of communication between the transmitter and the receiver. However, mutual coupling between antenna elements caused by surface waves and near or far fields [1] is particularly problematic. This not only affects antenna efficiency but also leads to other performance degradation including impedance mismatching, deviation of the radiation pattern, etc. Mobile communication systems exhibit a low coupling level at the base station, because separations of antenna elements occur at many wavelengths; however, the achievement of low mutual coupling at mobile terminals is very difficult due to limited volume[2].

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