

Triangular Lattices for Mutual Coupling Reduction in Patch Antenna Arrays

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Abstract— One of the issues in antenna arrays is the mutual coupling that occurs when two radiating elements are placed together. Mutual coupling can significantly degrade the performance of an antenna array. In this paper, we propose a triangular lattice configuration as a technique to reduce the mutual coupling in patch antenna arrays. A 4-element circular patch array with a triangular lattice is simulated and compared against a 4-element circular patch array with a square lattice in terms of their mutual coupling and radiation pattern. Comparisons are also made with other mutual coupling reduction techniques for closely packed antennas such as ground structure with slits, ground structures with removed substrates and ground structures with metal wall. The triangular lattice concept is then extended to the 9-element circular patch array. The 4-elements circular patch array with the triangular lattice and square lattice operating at 2.6GHz are then fabricated on FR4 printed circuit board.