# GAIN ENHANCEMENT OF ELECTRONICALLY STEERED DUAL-BEAM ANTENNA USING METAMATERIAL RADOME

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## ABSTRACT
The dual-beam steering antenna is a PCB-based circular patch antenna design for dual-beam steering, utilizing super-substrate multi-layer metamaterial radomes by stacking techniques of five metamaterial radomes. This design employs the original circular patch antenna, which consists of eight small square patches placed symmetrically at eight angles and separated by slots. The beam-steering property of this antenna can be implemented by controlling the on/off state of the PIN diodes, which are connected between each small square patch and main patch at each angle of the structure. The gain enhancement achieved using the metamaterial radomes uses a combination of Jerusalem cross-frequency selective surface and Square loop-frequency selective surfaces unit cells arranged in a 4×4 array. There are five layers, and each layer's distance depends on the wavelength, affects the gain, and efficiency improvement of the antenna with metamaterial radomes can be increased to at least 3 dB, radiating the waves for longer distances and covering more space.

**Keywords:** Beam-steering, Dual-beam, PIN-diode, Metamaterial, Meta-radome

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