

## Analysis and Design of Dual-Polarization Antennas for Wireless Communication Systems

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**Abstract :** The paper describes the design and simulation of dual-polarization antennas that use the resonance and radiating properties of the  $H_{00}$  mode of metal open waveguides. The proposed antennas are formed by two orthogonal slots in a finite conducting ground plane. The slots are backed by metal screens connected to the ground plane forming open waveguides. It has been shown that the antenna designs can be efficiently used in mm-wave bands. The antenna single mode operational bandwidth is higher than 10%. The antenna designs are very simple and low-cost. They allow flush installation and can be efficiently used in various communication and remote sensing devices on fast moving carriers. Mutual coupling between antennas of the proposed design is very low. Thus, multiple antenna structures with proposed antennas can be efficiently employed in multi-band and in multiple-input-multiple-output (MIMO) systems.

**Keywords :** antenna, antenna arrays, Multiple-Input-Multiple-Output (MIMO), millimeter wave bands, slot antenna, flush installation, directivity, open waveguide, conformal antennas

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