

Dual-Band Planar Bowtie Monopole for a Fall-Detection Radar and Telemetry System

Abstract

A dual-band planar bowtie monopole for a fall-detection radar and telemetry system is presented. Unidirectionality is successfully enabled by a full ground plane. A compact radiator footprint is achieved by closely spacing two bowtie elements for transmit-receive operation, combined with a simple and effective technique for mutual-coupling reduction. The radar antenna shows target location and speed detection capabilities of up to 4 m with resolution of 30 cm and fall-detection success rate of 95%. Its telemetry capability is then validated practically by frame transmissions through this antenna, which are successfully received by a base station located 5 m away.

Keywords

Biomedical applications of electromagnetic radiation, biomedical telemetry, radar antenna