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Payam Beigi, Pejman Mohammadi

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## A Novel Small Triple-Band Monopole Antenna with Crinkle Fractal-Structure

Payam Beigi<sup>1</sup>, Pejman Mohammadi<sup>2</sup>

<sup>1</sup>Young Researchers and Elite Club, Urmia Branch, Islamic Azad University, Urmia, Iran.(  
payam.beigi@yahoo.com)

<sup>2</sup>Department of Electrical Engineering, Urmia Branch, Islamic Azad University, Urmia, Iran.(  
p.mohammadi@iaurmia.ac.ir)

### Abstract

A novel monopole antenna with crinkle fractal-structure for multiband applications is presented. In this paper adding crinkle fractal leads to increasing the number of resonance frequency. The operating frequencies of the proposed antenna are 1.780/3.520/5.260 GHz. The prototype of the proposed antenna is fabricated on an inexpensive FR-4 substrate. The size of the proposed antenna is  $14 \times 14 \text{ mm}^2$  which has crinkle shape strip on top side. The radiation pattern of the proposed antenna is nearly omnidirectional. The simulated and the experimental results are in acceptable agreement with each other and confirm good performance for the offered antenna.

Keywords: monopole antenna, multiband applications, crinkle fractal-structure.

### 1. INTRODUCTION

Recently, the need for the design of an antenna with multiband operation has increased. The engineering new challenges in wireless communication systems include small-size, easy fabrication, low-cost, light weight, high-performance, and wide bandwidth antenna.

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