

## Performance Improvement of UWB Corrugated Antipodal Vivaldi Antenna Using Spiral Shape Negative Index Metamaterial

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**Abstract :** This paper presents a corrugated antipodal vivaldi antenna with improved performance by using negative index metamaterial (NIM) of the Archimedean spiral design. A single layer NIM piece is placed perpendicular middle of the two arm of the proposed antenna. The antenna size is  $30 \times 60 \times 0.787$  mm<sup>3</sup> operating at 8GHz. The simulated results of NIM corrugated antipodal vivaldi antenna show that the gain and directivity has increased up to 1.2dB and 1dB respectively. The HPBW is increased by 90 with the reflection coefficient less than  $-10$  dB from 4.7 GHz to 11 GHz for UWB application.

**Keywords :** Negative Index Metamaterial (NIM), Ultra Wide Band (UWB), Half Power Beam Width (HPBW), vivaldi antenna

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