

DIRECTIVE BEAM OF THE MONOPOLE
ANTENNA USING BROADBAND
GRADIENT REFRACTIVE INDEX
METAMATERIAL FOR ULTRA-
WIDEBAND APPLICATION

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ABSTRACT

- A novel techniques to enhance the gain of the basic monopole antenna by using broadband gradient refractive index (GRIN) metamaterial.
- The GRIN is designed by using parallel-line unit cell metamaterial with different refractive index.
- A seven GRIN lens is placed on the omni directional printed basic monopole antenna, perpendicularly. Due to the non-resonant and sub wavelength properties of the parallel-line elements
- The GRIN metamaterial lens has a broad bandwidth property with low loss.



EXISTING SYSTEM

- The ultra-wideband (UWB) antenna is significantly increased in the field of defense and commercial applications.
- Compared to other UWB antennas, the printed monopole antenna has several advantages such as planar structure, light weight, compact size, low cost, ease of fabrication and capable of integration with electronics system.
- At the same time, the antenna is suffering from low gain characteristics, and it depends on the size of the antenna
- The antenna array technique to enhance the gain which usually results in coupling between antennas, high cost or much trouble for designers



PROPOSED SYSTEM

- A gradient refractive index (GRIN) metamaterial lens is designed and integrated with monopole antenna.
- The lens is designed by using non-resonant parallel line metamaterial. This non-resonant structure is covered UWB frequency range, which has the capability to enhance the gain of the proposed antenna.
- The peak gain of the basic monopole is increased approximately by five times for GRIN lens.
- A directive beam of the basic monopole antenna is augmented with a broadband GRIN parallel line metamaterial



SOFTWARE REQUIREMENT

- Ansoft HFSS(High Frequency Structure Stimulator)
- CST

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