

# Design and simulation of Pyramidal Horn Antenna for NDT Applications

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**Abstract**— This paper describes a pyramidal horn antenna design which it works in a microwave domain. His operating frequency is 4.7 GHz. The parameters of the antenna were measured through its numerical modeling using *HFSS* (High Frequency Structure Simulator) electromagnetic simulation software. *HFSS* has the capability to calculate and plot a 3D image depicting the real beam of the gain. The obtained results show that an antenna gain of 12.90 dB was obtained at the frequency of 4.7 GHz, which means that the antenna is properly adapted to the transmission systems. This antenna will be used for non destructive testing (NDT) application, such as detection of cracks in different materials, materials characterization.

**Keywords**— *pyramidal horn antenna, finite element method, HFSS, Radiation pattern, gain, non destructive testing (NDT).*