

Analysis of 20 Stages, 64 J, 300 kV, Marx Generator UWB System

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Abstract— this paper gives the analysis of 20 stages, 64 J, 300 kV Marx generator for UWB application. The output pulse of Marx is sharpened by peaking stage and radiated by two types of antenna. Nanosecond pulse was fed to 1.5 meter length half transverse electromagnetic (HTEM) horn type antenna. Radiated field are observed at azimuthal angle and at various distances from the antenna. Design characterisation of the antenna was done using wavelet transform as the tool gives frequency components of the radiated pulse. The modelling and transient analysis of HTEM antenna and impulse radiating antenna was done in computer simulation technology (CST) - microwave studio software.

Keywords- Antenna, impulse, Marx generator, wavelet transform

I. INTRODUCTION

The impulse radiating systems are the important in the field of electromagnetic testing of electronic equipment, image processing, and in ultra-wideband radar technology. It also has wide range of application in the electronic war fair. To get the higher detection range, we need to have higher effective radiated power. This could be obtained from the UWB source consisting of RLC circuit with very low inductance producing low rise time pulses. In this paper, we characterize the compact 20 stages, 64 J, 300 kV Marx generator connected to the impulse radiating antenna to convert it into UWB system. This Marx generator has inbuilt peaking stage connected to the last stage of Marx circuit.

II. UWB SYSTEM

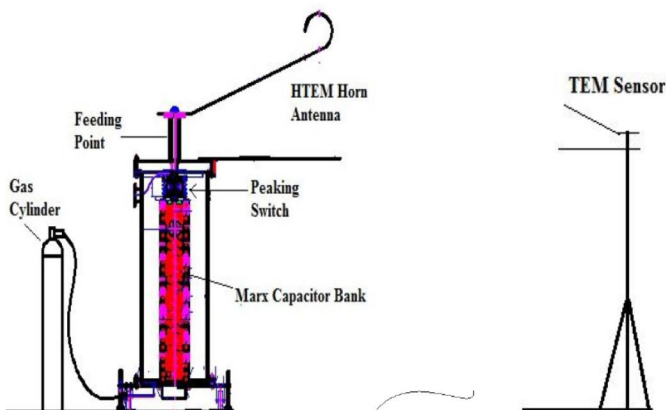


Figure 2 Schematic Diagram

III. RESULTS

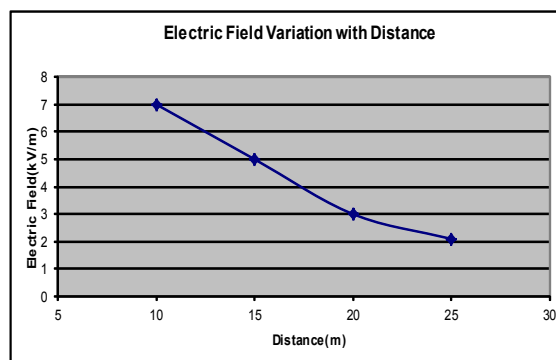


Figure 2 Far field

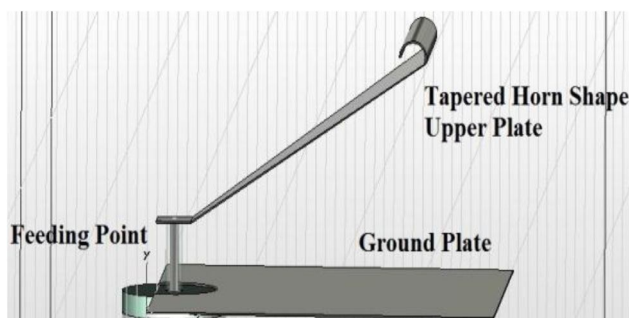


Figure 3 CST model

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