

Fast L-band demonstrator for Remote Induction of Disturbance for Access Denial (RIDAD)

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Abstract—RIDAD, a prototype for a narrowband High Power Electromagnetic Radiator in the MW power range and operating at L-band using a pulsed Magnetron source is presented. The system is intended to demonstrate High Power Electromagnetic effects on electronic equipment and EMC studies. The electric and mechanic setup is shown and discussed.

Keywords: High-Power Electromagnetic Effects; HPEM; Pulsed Magnetron

I. INTRODUCTION

In this paper, a High-Power Electromagnetic Radiator (HPEM) operating in L band is presented. The system is intended as a cost efficient narrowband demonstrator for addressing high power electromagnetic effects on electronic equipment [1].

Currently, possible High-Power sources include Klystrons (for MW range applications), Magnetrons and Solid-State technology: Solid-State amplifiers lack the capability of operating in the MW power range, while Klystron, although capable of higher power output, is less cost-effective compared to Magnetron.

The final architecture uses a Magnetron operating at 1.3GHz and is able to deliver more than 1 MW peak power. We'll describe the overall system architecture, consisting of pulsed Magnetron, High-Voltage Pulse Modulator, Mode Converter and Antenna. Finally, test results are shown.

II. SYSTEM ARCHITECTURE

In Fig.1, the general architecture of the transmitter is presented: it comprises a High-Voltage Pulse Modulator and Peaking Box unit for high Voltage generation, Heater Power Supply and Magnetron; the Magnetron's output port is connected to the Radiator through a Mode Converter, which in our system is made by an L band Standard Gain Horn with an in-house design lens introduced to include the overall gain.

The final integrated system with antenna and directional coupler for power monitoring is shown in Fig.2.

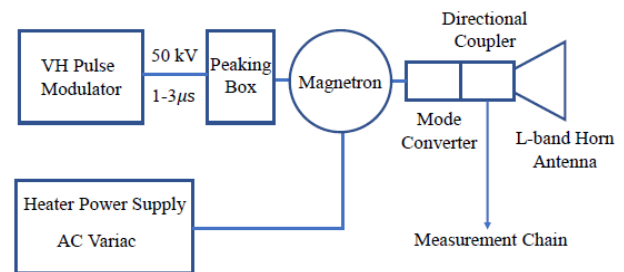


Figure 1. General System Architecture.

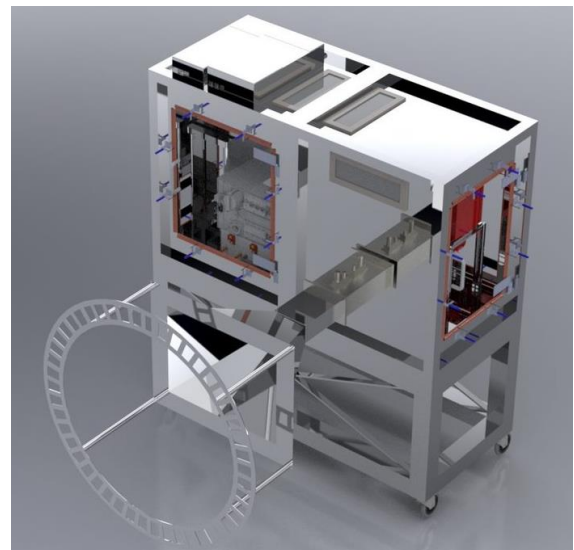


Figure 2. Integrated transmitter (shielded box) and radiator (horn and lens).

III. TEST RESULTS

The measured E-field at 6.8m is presented in Fig.3. The resulting Vfar from the test is 55kV.

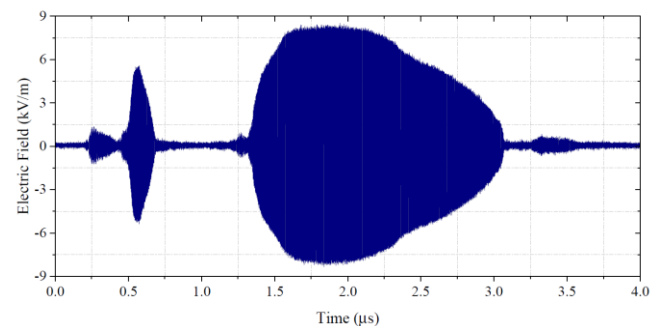


Figure 3. Measured E-Field.

REFERENCES

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