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GYROMAGNETIC NONLINEAR TRANSMISSION LINE WITH SEALED SPARK GAP

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This paper discusses the experimental results of a reprinted NLTL based HPM source featuring a sealed, mid-plane triggered, spark gap switch. This new design feature is expected to result in more robust and repeatable performance. Previous high repute (>100 Hz) NLTL systems employed trigatron spark gaps with high pressure flow which suffered from non-repeatable operation.

The NLTL is driven from a 2.1 nF capacitor charged to ~40 kV. The trigger generator outputs a negative polarity > 50 kV pulse with a repute capability > 1 kHz. COTS NiZn ferrites with 8 mm ID and 16 mm OD were employed in the NLTL coaxial line. Output frequency for this size ferrite resulted in 0.7 to 1.5 GHz. The output end of the NLTL is connected directly to a simple TEM horn antenna without the inclusion of a balun. Various experimental observations are presented including spark gap voltage, in-line voltage, and radiated waveforms.

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