2018 IEEE International Power Modulator and High Voltage Conference



Contribution ID: 270

Type: Poster Presentation

A High Voltage, Self-Matching, Nanosecond Pulser for Calibration and Experimentation

Monday 4 June 2018 13:30 (1h 30m)

Laboratory equipment is sometimes required to be calibrated in-situo and, in those scenarios, a pulse with frequency content exceeding the intended voltage source is needed. Moreover, for sensors that are highly attenuated, the calibration pulser must also be high voltage and very reproducible. Because the calibration pulser is intended to be used across a wide variety of experiments, it has been made to be independent of the load impedance- known as a self-matching circuit. This variable high voltage self-matching pulser gives the user the ability to analyze his or her equipment using a consistent pulse. The self-matching aspect of this device is what makes it so unique and consistent. The pulser is made using a transmission line whose impedance is matched to several resistors. These resistors are responsible for absorbing the reflections that are generated by the load/transmission line interface. Because of this, the users output will show the voltage pulse across the load and the reflections at this interface will travel to the transmission line/resistor interface where the pulse will be absorbed due to matching impedances. In practice however, there are slight reflections generated due to a mismatch between the resistors and the transmission line, but because the pulse itself is so consistent the device can still be used for calibration purposes. The variable high voltage self-matching pulser can be used between .5 kilovolts and 30 kilovolts and although the amplitude of the pulse may change with the variably the shape of the pulse does not change. It has proven to be a useful calibration tool as well as a pulsed source.

Authors: HARJES, Cameron (University of New Mexico); POUNCEY, Jon (University on New Mexico); LEHR, jane (University of New Mexico)

Presenter: HARJES, Cameron (University of New Mexico)

Session Classification: Poster 1 - Dielectrics and Electromagnetic Phenomena

Track Classification: Power Electronics, Power Supplies, Prime Power, Rotating Machines, and Energy Converters