Contribution ID: **1209** Type: **Poster**

2P65 - Design of A Long Pulse High Energy Water Transmission Line to Drive HPM Sources

Tuesday 25 June 2019 13:00 (1h 30m)

The University of New Mexico has designed and built a 10-stage high energy Marx generator with a pulse length of 1.5 Microseconds. This Marx generator has the capability to drive low impedance HPM loads such as the Magnetically Insulated Line Oscillators as well as HEDP loads like a DPF. A transmission line coupling the Marx to the load is the typical energy transfer mechanism for such a system. However, these loads require both fast rise times as well as relatively flat top peaks as both coupling of electromagnetic fields to cavities and plasma density during stagnation are sensitive to the onset of peak fields and to peak voltage variations. Additionally, both loads are sensitive to capacitive coupling of the Marx charge voltage to the load-leading to premature plasma production and possibly leading to instabilities in the run down phase of DPF devices as well as early onset of neutral desorption in HPM sources. All of these problems must be addressed by careful transmission line design. To this end, this presentation discusses time- and frequency-domain finite element electromagnetic numerical simulations of a 2.5-meter-long, high dielectric constant (81) water transmission line with a spark gap peaking switch, as well as with an additional pre-pulse peaking switch.

Author: Mr CHAVEZ, Ian (University of New Mexico- Electrical and Computer Engineering Department)

Co-authors: SCHAMILOGLU, Edl (University of New Mexico); ILYENKO, Kostyantyn (Department of Vacuum Electronics of the Institute for Radiophysics and Electronics of National Academy of Sciences of Ukraine); TETYANA, Yatsenko (Department of Vacuum Electronics of the Institute for Radiophysics and Electronics of National Academy of Sciences of Ukraine); Dr PORTILLO, Salvador (University of New Mexico - Electrical and Computer Engineering Department)

Presenter: Dr PORTILLO, Salvador (University of New Mexico - Electrical and Computer Engineering Department)

Session Classification: Poster - Microwave Generation and Plasma Interactions and Pulsed Power Switches and Components

Track Classification: 5.4 Transmission Line & Transformers