



Contribution ID: 555

Type: **Oral**

## Low-Impedance S-Band MILO

*Thursday 27 June 2019 13:45 (15 minutes)*

The development of a low-impedance magnetically insulated line oscillator (MILO) driven by a compact Marx generator developed by Texas Tech University is discussed. The goals of the project aim to develop a MILO operating within the S-Band that can provide an RF peak output power of greater than 1 GW with greater than 10% efficiency. The device design followed a set of base design equations that were applied to a CST Studio Suite for a Particle-in-Cell, PIC, simulation to model the MILO. These simulation results then inform changes to the model to optimize the prospective performance of the device.

The simulations were developed to account for realistic material properties that were then applied to critical surfaces of the device. Additionally, a circuit simulation was included to model a Marx generator feeding the input of the MILO to simulate the eventual experimental setup. Current results verify an expected RF peak power of approximately 4.5 GW at 2.5 GHz operating in the TM<sub>01</sub> mode when excited with an input signal that has a peak voltage of 600 kV while providing a peak current of 58 kA. The simulation confirms the design should perform within these constraints.

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**Session Classification:** 2.5 Codes and Modeling and 2.8 THz Sources, Radiation, and Applications

**Track Classification:** 2.5 Codes and Modeling