

Abstract Submitted  
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**Axial Magnetic Field Effects on Magnetically Insulated Line Oscillators (MILO)**<sup>1</sup> NICHOLAS JORDAN, DREW PACKARD, CHRISTOPHER SWENSON, YY LAU, RONALD GILGENBACH, University of Michigan — The Magnetically Insulated Line Oscillator (MILO) is a crossed-field high power microwave device capable of multi-gigawatt operation. Intense axial currents generate a self-magnetic field strong enough that no external magnets are required, but contribute to low device efficiency (typically <10%). While MILOs have been studied for several decades, many fundamental questions remain. The University of Michigan is currently revisiting MILO theory and design, taking advantage of recent improvements in 3D particle-in-cell codes, pulsed power technology, and additive manufacturing techniques to study MILO. In particular, a MILO is being explored with an external, axial magnetic field to prevent electron losses before magnetic insulation is established. The operating condition, stability, and efficiency of MILOs will be investigated with versus without axial magnetic fields, as well as MILO variants capable of low voltage or multi-frequency operation. Simulations of axial magnetic field effects on MILO operation will be presented.

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