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Computational Study of Plasma Radiation in MITL Gap MILENA A. ANGELOVA, BRUNO S. BAUER, VOLODYMYR MAKHIN, RICHARD E. SIEMON, STEPHAN FUELLING, University of Nevada, Reno — Magnetically insulated transmission lines (MITLs) employ the principle of magnetic insulation to efficiently transmit energy from a source to a load. They are a part of pulsed power devices such as fast zpinches and particle accelerators, which operate in the regime of extremely high voltages. Cathode plasma produced as a result of strong electric fields in MITLs may significantly decrease the amount of transmitted energy or may close the MITL gap causing an electrical termination. An understanding of plasma formation and evolution in MITL gap can help improve the efficiency of energy transmission, thereby improving the design and characteristics of some pulsed power devices. Plasma evolution in MITL gap is complex, involving several competing processes, including magnetic field-plasma interactions and plasma radiation. This study concentrates on the understanding of plasma radiation and the ways this radiation affects the plasma evolution in the MITL. This paper will present the results of one and two-dimensional magnetohydrodynamic plasma simulations as well as the development of CRE tables for plasma radiation, EOS, and transport coefficients.

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