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Ionization, Transport and Non-Ideal Equations of State Models for the Pulsed Inductive Plasma Thruster[1] ANDREW RITCHIE, KAMESH SANKARAN, Whitworth University, WHITWORTH UNIVERSITY TEAM — A computational model accounting for the internal thermodynamic state of the plasma sheet into an existing electro-mechanical model of pulsed inductive plasma acceleration is presented. The model includes the effects of electronic excitation, ionization, transport and non-ideal equation of state of the plasma and incorporates them into a set of circuit equations that are coupled to an equation of motion and energy equation for the plasma. Calculations showing the time-evolution of the various sources and sinks in the plasma-circuit system are presented to demonstrate the efficacy of the model. Comparisons with experimental data and with previous models show the utility of this model in aiding experimental research on inductive pulsed plasma accelerators.

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