Michigan Institute for Plasma Science and Engineering (MIPSE)

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Project Description

Given the rising concentrations of atmospheric CO2 emissions and their nontrivial effect on the environment, solutions for CO2 reduction have gained increasing interest in the scientific community. Laura plans to address this issue in her dissertation project by building a non-equilibrium atmospheric pressure microwaves discharge for CO2 conversion. The energy and conversion efficiencies will be studied with and without the addition of catalyst material in the discharge zone. Once the plasma system is optimized for conversion of CO2 to CO, other gas species such as hydrogen or water vapor will be added to stimulate the creation of usable hydrocarbons. To compliment her experimental work, Laura will also run computer simulations using a global kinetic model to examine the different chemical reactions produced by the reactive species created in the plasma. This model will predict the evolution of species in the plasma based on specific experimental operating conditions.

Publications/Presentations

- Dissociation of CO2 in a Radio-Frequency Plasma Source