

Abstract Submitted
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Characterization of a Martian Simulated Discharge¹ DERETH DRAKE, SVETOZAR POPOVIC, LEPOSAVA VUSKOVIC, Department of Physics, Old Dominion University — We performed a detailed characterization of a Martian simulated discharge at Mach 2.15. Supersonic flow was generated using a convergent-divergent nozzle upstream of the discharge region. Gases were premixed in the stagnation chamber at room temperature by adding 2.75% N₂ and 1.55% Ar to pure CO₂. A cylindrical microwave cavity was used to sustain a discharge in the mixture in the pressure range of 100-600 Pa. Optical emission and absorption spectroscopy were used to determine excited state populations and electron temperature from the Ar spectra. The gas temperature and electron density were determined from the CO Ångstrom bands and N₂ C³Π_u-B³Π_g system, respectively. Results were compared with a kinetic model that included adequate concentrations of CO₂, N₂, and Ar, along with CO, O₂, and NO, in the discharge mixture.

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