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**On the kinetic description of Martian Entry Plasma** DERETH DRAKE, University of Iowa, MILKA NIKOLIC, SVETOZAR POPOVIC, LEPOSAVA VUŠKOVIC, Old Dominion University — We are presenting results, which proved the basis for the study of processes that are of interest for utilizing Martian Atmospheric Entry Plasma (MAEP), such as oxygen production, effects of water presence, magnetohydrodynamic control of the plasma flow, and energy conversion. In our continuous effort to explore systems that utilize energy dissipated in MAEP [1, 2], we have assessed the newly consolidated data on the Martian atmospheric conditions, which demand corrections in the kinetic model of the MAEP. Conditions in Mars ionosphere provide seeding electrons that contribute to the formation of the ionizing wave in MAEP. Distribution of electron density and the temperature in the ionizing wave define the reduced electric field, which varies by several orders of magnitude during the entry trajectory. To the less extent, the reduced electric field also varies across the ionizing wave. We combined the MAEP flow models with the charge particle kinetics to determine the reduced electric field distribution, examine the conditions for formations of lateral instabilities, and determine local MAEP gas composition.

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