

Abstract Submitted
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Plasma characterization during dust formation in a N₂ CH₄ CCP RF discharge¹ GAËTAN WATTIEAUX, GREMI, Orleans University, ELLA SCIAMMA-O'BRIEN, LATMOS/CNRS, JOHANNES BERNDT, GREMI, Orleans University, NATHALIE CARRASCO, LATMOS/CNRS, LAÏFA BOUFENDI, GREMI, Orleans University, GUY CERNOGORA, LATMOS/CNRS, GREMI/CNRS COLLABORATION, LATMOS/CNRS TEAM — A capacitively coupled radiofrequency discharge in methane nitrogen (N₂-CH₄) gas mixture is used to simulate the formation of solid aerosols of Titan's atmosphere. When dust particles are formed in this kind of discharges, they induce drastic changes in the discharge and plasmas characteristics such as: electron temperature and density, gas composition, self bias etc. In the present work, electron density is measured thanks to resonant microwave cavity method. The time evolution of electron temperature is evaluated using Optical Emission Spectroscopy through an Argon line. In-situ mass spectrometry is used to follow the evolution of the gas composition. Correlation between the results given by all these diagnostic tools shows that the dust particles growth kinetics takes few tens of seconds. This can be clearly observed through the time evolution of the methane consumption and the electron density decay. This decay is balanced by an increase of the electron temperature.

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