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Contribution ID: **3042** Type: **Oral Competition (Graduate Student) / Compétition orale (Étudiant(e) du 2e ou 3e cycle)**

(G*) Nanosecond Pulsed Discharge in Air with the Presence of Micrometre Particles: Investigation of the Electrical and Optical Properties

Wednesday 8 June 2022 14:30 (15 minutes)

Dusty or complex plasmas is a branch of plasma physics that aims to investigate the interactions between a plasma and solid particles with a size ranging from nanometers to micrometers. Most of the available studies have addressed these interactions under low pressure conditions. Currently, there is a lot of interest to process micrometer particles, e.g. in mining industry, and the plasma discharges seems to have great potential. Indeed, as it is highly reactive and can be sustained in different media at different pressures, plasma may provide innovative solutions to this field, particularly because it can be developed at low-cost. This contribution presents a study of air-driven pulsed nanosecond discharges in contact with micrometer powders that have different size distributions, namely 20-38, 38-106, and 106-150 µm. The plasma interacts with the microparticles and erodes its surface, while producing a distribution of particles with smaller size. This finding has been evidenced by scanning electron microscopy imaging. Under such conditions, we monitored the temporal evolution of the discharge electrical characteristics and found a comprehensive relationship. The evolution of plasma properties, using optical emission spectroscopy technique, will be also provided. Finally, as the gap distance plays a crucial role on the discharge mode and, thus, on the plasma-particles interactions, the influence of this parameter on the above mentioned properties will be discussed.

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