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**Interplay between discharge physics, gas phase chemistry and surface processes in hydrocarbon plasmas** KHALED HASSOUNI, CNRS, Universite Paris 13 — In this paper we present two examples that illustrate two different contexts of the interplay between plasma-surface interaction process and discharge physics and gas phase chemistry in hydrocarbon discharges. In the first example we address the case of diamond deposition processes and illustrate how a detailed investigation of the discharge physics, collisional processes and transport phenomena in the plasma phase make possible to accurately predict the key local-parameters, i.e., species density at the growing substrate, as function of the macroscopic process parameters, thus allowing for a precise control of diamond deposition process. In the second example, we illustrate how the interaction between a rare gas pristine discharge and carbon (graphite) electrode induce a dramatic change on the discharge nature, i.e., composition, ionization kinetics, charge equilibrium, etc., through molecular growth and clustering processes, solid particle formation and dusty plasma generation.

Work done in collaboration with Alix Gicquel, Francois Silva, Armelle Michau, Guillaume Lombardi, Xavier Bonnin, Xavier Duten, CNRS, Universite Paris 13.

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