Abstract Submitted
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Student Award Finalist - Simulation of the reignition of atmospheric pressure air discharges behind dielectric obstacles: comparison with experiments[1] FRANCOIS PECHEREAU, ANNE BOURDON, Laboratory EM2C, Ecole Centrale Paris, France — In recent years, experimental studies on plasma assisted catalysis for flue gas treatment have shown a significant reduction of pollutants at a low energetic cost. Catalyst supports are either random or organized two phase media such as pellets, monoliths or porous media. Then, in plasma reactors, atmospheric pressure discharges have to interact with many obstacles and to propagate in microcavities and pores. To better understand the discharge dynamics in these complex structures, experiments have been carried out at LPGP (Orsay, France) in a point-to-plane geometry with a dielectric plane obstacle placed in the discharge path. In this work, we have carried out discharge simulations in the experimental geometry. We have compared the dynamics of the discharge ignited at the point and its impact on the dielectric surface. Then, we have compared the conditions of a discharge reignition behind the dielectric obstacle. A good qualitative agreement with experiments has been obtained but to improve the quantitative comparison, we have carried out a detailed parametric numerical study. In this work, we will focus on the influence of the level of seed charges on the discharge reignition and discuss several physical processes that could have an impact on the level of seed charges.

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