Spatial-temporal behavior of individual microdischarges in dielectric barrier discharge

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Abstract. Results of experimental study on a spatial-time behavior of microdischarges (MDs) in steady-state dielectric barrier discharge (DBD) are presented. It was revealed that MDs of DBD have a spatial "memory", i.e., every subsequent MD does not jump in arbitrary point of the barrier surface but appears exactly at the same place that was occupied by the preceding MD. This memory is derived from slow recombination of plasma in the MDs channels for a period between two neighbor half-periods (HPs). In such a case, there is no necessity in newly local avalanche volume breakdowns at every HP. MDs in steady-state DBD have a great scattering with time of their appearance over every HP. This scattering is attributed to the local surface breakdowns around every MD.

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Transitions between space charge limited and temperature limited emission of electrons from a planar collector immersed in a plasma that contains an electron beam

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Abstract. Potential formation in front of a negative electron emitting electrode immersed in a plasma that contains a mono-energetic electron beam is studied by a one-dimensional fluid model. Dependence of the floating potential of the electrode and of the potential where transition from space charge limited into temperature limited emission occurs on electron emission are calculated. The current voltage characteristics of the electrode is then calculated and the "saturation" of the collector floating potential with respect to increasing electron emission is explained quantitatively. The plasma parameters are selected in such a way, that they are suitable for later comparison with emissive probe data in low pressure discharge plasma devices.

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First results of the COMPASS tokamak

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Abstract. The present status of the COMPASS tokamak, diagnostics and additional systems as well as the first results are described. The COMPASS tokamak has recently started its new operation in the Institute of Plasma Physics of the Academy of Sciences of the Czech Republic in Prague, Czech Republic. COMPASS will be able to operate in a clear H-mode in ITER-relevant geometry and will be equiped by a comprehensive set of diagnostics focused mainly on edge plasma region. High plasma performance will be achieved by two neutral beam injection systems.

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An experimental and modelling study of acetaldehyde oxidation by an atmospheric non-thermal plasma discharge

Charles Klett, Sylvain Touchard, Arlette Vega, Michael Redolfi, Xavier Duten, Khaled Hassouni

Abstract. The results obtained for the degradation of acetaldehyde by an atmospheric plasma corona discharge in a wire to cylinder (WTC) configuration are reported. The process efficiency is characterized in terms of acetaldehyde removal efficiency as a function of the input energy. Main degradation products CO, CO_2, CH_3OH are identified and quantified. A homogenous 0D chemical model allows us to simulate the studied experimental conditions. Simulation results are in a quite good accuracy with experiments.

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Laser–plasma coupling in the shock-ignition intensity regime

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Abstract. A novel approach to ICF called shock ignition, that relies on delivery of a very strong shock created by a laser pulse at intensities around 10^{16} Wcm^{-2}, is investigated. In this context, an experiment using two beams from the Prague Asterix Laser System with time duration of 300 ps was performed at the PALS laboratory. The first beam at low intensity was used to create extended preformed plasma, and the second one to create a strong shock. Several diagnostics were used to characterize the preformed plasma and the interaction of the main pulse with the target.

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