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Phase-resolved measurement of surface charge deposition in a laterally patterned barrier discharge system[1] LARS STOLLENWERK, ROBERT WILD, University of Greifswald, Inst. of Physics — In the present contribution a barrier discharge system with plane parallel electrodes is investigated. With appropriately chosen parameters, a patterned glow-like discharge arises. In the case of laterally inhomogeneous discharges (i. e. in the present patterned discharges or in the common filamentary discharges) also the surface charge distribution on the dielectric barriers is inhomogeneous. Due to its deformation of the electric field it provides a memory effect and thus contributes essentially to the stabilisation of the lateral structure. Therefor, the measurement of the surface charge has been come into focus in the last decade. In this contribution, spatially and temporally resolved electro-optical surface measurements are presented. The high temporal resolution allows for the first time the observation of the charge deposition during a single breakdown. The process starts in the center of a remnant surface charge spot, where the electrical field is highest. The maximum of the electrical field then moves radially outwards. A surface charge spot is hence replaced from the inside out by a charge spot of opposite polarity. These experimental findings verify previously unconfirmed predictions from earlier numerical calculations.

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