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## High Voltage Conditioning in high vacuum on concave electrodes. Developments and possible applications associated to accumulation points on electrode surfaces

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Counterintuitive experimental evidences have been observed during High Voltage Direct Current (HVDC) tests of two concave, axial-symmetric, electrodes insulated by large vacuum gaps of 3 and 7 cm with voltages from 150 to 370 kVdc. The dissipation of microdischarge power during the conditioning procedure occurs mostly on the anodic side in a region close to the axis of the system where the electric field is at a minimum, far from the positions where the breakdowns have been observed.

Numerical simulations, based on ray-tracing algorithm, correctly identify the positions where the power dissipation of microdischarges occurs. A mutual exchange of charged particles in the electrostatic field between electrodes seems a reasonable physical mechanism to interpret the observations.

The areas with the most intense electric field, typically located on the surfaces of the electrodes under test, are not necessarily the sole surfaces involved in the HVDC conditioning in high vacuum. Drift of charged particles toward accumulation points on the electrode surfaces can focus the microdischarge power, possible developments and applications based on this effect are analysed and discussed

### Topic

Experiments and Diagnostics

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