



ANALYSIS OF CORONA DISCHARGE IN ELECTROSTATIC MOTOR GAPS

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Abstract:

This paper is aimed at calculating corona current-voltage characteristics of a new design of an electrostatic motor with a cylindrical rotor made from aluminium foil and multi stator copper electrodes. The stator electrodes are alternately stressed positively and negatively. The corona currents emitted from positively and negatively-stressed electrodes are calculated being dependent on the applied voltage and motor geometry. The method of calculation is based on simultaneous solution of Poisson's equation, current density equation and continuity equation for current density. This calls at first for calculation of the spatial distribution of electric field within the motor volume using the accurate charge simulation technique. The calculated current-voltage characteristics of the motor agreed reasonably with those measured experimentally for three motors built-in the laboratory.

Keywords:

Electrostatic motor, corona-discharge, electric field, corona current.

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