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Collective motion of large number of cathode spots

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The purpose of the present paper is to investigate numerically the movement of many cathode spots in interaction through their self-magnetic field. The movement of the spots is assumed to be controlled by a combination of stochastic random motion and a drift in the retrograde direction. It is shown that the cathode spots randomly nucleate near the center and then move towards the edge of the electrode. Many spots move collectively in the form of alignments of 3 to 7 spots. For large applied currents, the spots form a cloud that expands periodically in an anisotropic way. We show that under some conditions, the spots form a cloud that rotate regularly over the surface of the electrode.

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