

Abstract Submitted
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Control of transport and distribution of dust particles via Electrical Asymmetry Effect SHINYA IWASHITA, Ruhr-University Bochum, GIICHIRO UCHIDA, Kyushu University, JULIAN SCHULZE, EDMUND SCHUENGE, Ruhr-University Bochum, PETER HARTMANN, Hungarian Academy of Science, MASAHARU SHIRATANI, Kyushu University, ZOLTAN DONKO, Hungarian Academy of Science, UWE CZARNETZKI, Ruhr-University Bochum — We are developing a novel method to manipulate particles in capacitively coupled rf discharges via the Electrical Asymmetry Effect, which allows to control both the spatial potential profile as well as the ion density distribution by adjusting the phase angle θ between a fundamental frequency and its second harmonic. We report first experimental results of this method using SiO_2 particles of around $1 \mu\text{m}$ in size, which are inserted into an argon discharge operated at low pressures. By changing θ from 0 to 90 degree particles are transported rapidly from the plasma-sheath region around the lower powered electrode to that around the upper grounded electrode. The spatial distribution of forces exerted on particles, such as ion drag and electrostatic forces, will be discussed based on PIC simulation results. Funding: German Federal Ministry for the Environment (0325210B), Alexander von Humboldt Foundation, RUB Research Department Plasma, Hungarian Scientific Research Fund (OTKA-K-77653+IN-85261)

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