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Evolution of self-organized poloidal dust rotation with discharge parameters P. K. CHATTOPADHYAY, SAYAK BOSE, M. KAUR, J. GHOSH, D. SHARMA, Y. C. SAXENA, Institute for Plasma Research — Stationary self-organized, poloidally rotating and toroidally symmetric structure of mono-dispersed micro-particles are obtained in parallel plate DC glow discharge plasma with modified cathode geometry [1]. The evolution of the vortices with discharge parameters is presented. A transition from a filled-vortex (poloidal cross-section of the toroidal structure) to a vortex with void at the centre is observed with increase in neutral gas pressure accompanied by a decrease in vortex height from cathode surface. The variation of the velocity profile of the dust particles constituting the vortex is investigated using PIV analysis with discharge parameters. Interestingly, the velocity of the dust particles is observed to increase with an increase in neutral gas pressure. The observed experimental results and its causes are presented in details.
[1]Kaur et al., Phys. Plasmas 22, 033703 (2015).

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