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Dust particle dynamics in the afterglow of pulsed RF dusty plasmas[1] TOSHISATO ONO, YUNXIANG QIN, Univ of Minnesota - Twin Cities , ZHILI ZUO, CHANGGONG WANG, SONG-MOON SUH, Applied Materials, Inc., CHRIS HOGAN, UWE KORTSHAGEN, Univ of Minnesota - Twin Cities — The spatiotemporal evolution of dust particles in plasmas is of interest for applications in the particle synthesis in plasmas and the mitigation of contamination issues in semiconductor processing. In this work, particle visualization by laser light scattering (LLS) measurements has been conducted in dusty argon plasmas generated in an RF capacitive reactor. We particularly focus on the particle dynamics in the afterglow of a pulsed plasma. In this regime, the predominant forces acting on particles rapidly change from the electrostatic and ion drag forces to the neutral drag and thermophoretic forces. Particle size effects are of particular interest. We utilized a combination of an ultrasonic nebulizer and a drying column to deliver dry highly monodisperse particles into the reactor. The LLS results suggest that particle trapping locations in steady-state and settling velocity in the afterglow plasma strongly depend on particle size.

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