

Abstract Submitted
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Measurement of dust particle size and density by a laser light scattering and extinction method CHANGRAE SEON, KILBYOUNG CHAI, HOYONG PARK, KAIST, YONGHYUN SHIN, KWANGHWA CHUNG, KRISSE, WONHO CHOE, KAIST — The measurement of dust particle density was performed using the laser light extinction method. Using two spherical mirrors, a multi-pass setup was used for lowering the measurement limit of the system. In parallel, the particle size was measured using the laser light scattering method. To self-consistently determine the time evolution of the particle size, in-situ polarization-sensitive laser light scattering was used. Polarization light intensities (incident and scattered light intensities with the same polarization) were measured at 71° . Before applying the method to the dusty plasmas, the measurement accuracy was confirmed using a distilled water solution of the size-known particles. In addition, the size-known particles were injected into the argon plasma, and the particles trapped inside the plasma were used for the accurate measurement of the light scattering angle. The measured size of the dust particles in a Ar+SiH₄ (5%) 13.56 MHz capacitively-coupled plasma (160 mTorr, 150 W, 10 s after plasma on) was about 118 nm, which was also confirmed by scanning electron microscope photographs. The time evolution of the particle size and its number density was studied by both methods.

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