

Abstract Submitted
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Long-range correlation of nanoparticle growth in in low pressure reactive VHF discharge plasmas MASAHARU SHIRATANI, KUNIHIRO KAMATAKI, YASUO MORITA, HYUNWOONG SEO, HAHO ITAGAKI, GIICHIRO UCHIDA, KAZUNORI KOGA, Kyushu University, KYUSHU UNIVERSITY COLLABORATION — We report experimental results on long-range correlation of growth of nanoparticles in capacitively-coupled VHF discharges with amplitude modulation (AM) obtained using two dimensional laser light scattering method [1-3]. AM gives an artificial plasma fluctuation, which brings about 100% increase of density of nanoparticles, 23% decrease of their size, and narrower size dispersion. The growth of nanoparticles show strong time and spatial correlation for discharges with AM, where as it has little time and spatial correlation for discharges without AM. The long-range correlation over the whole plasma region brings about narrow size distribution of nanoparticles. The long-range correlation is not explained by transport of nanoparticles. Coupling between nanoparticles and other species can be the key to the long-range correlation.

- [1] K. Kamataki, et al., J. Inst. 7 (2012) C04017.
- [2] K. Kamataki, et al., Thin Solid Films in press.
- [3] K. Kamataki, et al., Jpn. J. Appl. Phys. in press.

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