Abstract Submitted
for the GEC15 Meeting of
The American Physical Society

Cross correlation analysis of plasma perturbation in amplitude modulated reactive dusty plasmas TEPPEI ITO, MASAHIRO SOEJIMA, DAISUKE YAMASHITA, HYUNWOONG SEO, NAHO ITAGAKI, KAZUNORI KOGA, MASAHARU SHIRATANI, TATSUYA KOBAYASHI, SHIGERU INAGAKI, Kyushu University — Interactions between plasmas and nano-interface are one of the most important issues in plasma processing. We have studied effects of plasma perturbation on growth of nanoparticles in amplitude modulated reactive dusty plasmas and have clarified that amplitude modulation (AM) leads to suppression of growth of nanoparticles [1]. Here we report results of cross correlation analysis of time evolution of laser light scattering intensity from nanoparticles in reactive plasmas. Experiments were carried out using a capacitively-coupled rf discharge reactor with a two-dimensional laser light scattering (LLS) system. We employed Ar+DM-DMOS discharge plasmas to generate nanoparticles. The peaks at higher harmonics and subharmonics in spectra of laser light scattering intensity were detected, suggesting nonlinear coupling between plasma and nanoparticle amount. We found high cross correlation t between waves at AM frequency and its higher harmonics. Namely, perturbation at f_{AM} closely correlates with those at higher harmonics.

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Date submitted: 19 Jun 2015 Electronic form version 1.4