LASER INDUCED FLUORESCENCE SPECTROSCOPY IN THE VOID REGION OF A NANOPARTICLE FORMING PLASMA

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Résumé

Huge quantities of nanoparticles can strongly modify plasma properties [1, 2] by the trapping of free electrons at their surface [3]. This provokes an increase in the electron temperature [4, 5] and, in return, the entire chemistry is affected. Often plasma instabilities can be observed in nanodusty plasmas, some of them on time scales visible to the human eye [6, 7]. Because instabilities are a tempo-spatial phenomenon that can evolve on short time scales, adequate techniques to examine their nature are rare.

In this study laser induced fluorescence [8] and absorption [9] spectroscopy were used to monitor the evolution of argon metastable atoms in a low pressure argon RF plasma. The growth of dense nanoparticle clouds is achieved from sputtering melamine-formaldehyde from the reactor walls and electrodes. The spectroscopic data are correlated with the pressure evolution and discharge current [10] in order to investigate the impact of localized effects, like void formation, on the global process parameters.

Références

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