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Interaction of UV laser pulses with reactive dusty plasmas FERDI VAN DE WETERING, JOB BECKERS, SANDER NIJDAM, WOUTER OOSTERBEEK, Eindhoven University of Technology, The Netherlands, EVA KOVACEVIC, JOHANNES BERNDT, GREMI UMT 7344 CNRSUniversite d'Orleans, France —
This contribution deals with the effects of UV photons on the synthesis and transport of nanoparticles in reactive complex plasmas (capacitively coupled RF discharge). First measurements showed that the irradiation of a reactive acetylene-argon plasma with high-energy, ns UV laser pulses (355 nm, 75 mJ pulse energy, repetition frequency 10Hz) can have a large effect on the global discharge characteristics. One particular example concerns the formation of a dust void in the center of the discharge. At sufficiently high pulse energies, this formation of a dust free region - which occurs without laser irradiation—is totally suppressed. Moreover the experiments indicate that the laser pulses influence the early stages of the particle formation. Although the interaction between the laser and the plasma is not yet fully understood, it is remarkable that these localized nanosecond laser pulses can influence the plasma on a global scale. Besides new insights into fundamental problems, this phenomenon opens also new possibilities for the controlled manipulation of particle growth and particle transport in reactive plasmas.

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