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Space – time evolution of low-pressure H2 plasma induced by run-away photoelectrons produced by KrF laser pulse ALEXEY ZOTOVICH, ANDREY VOLYNETS, Moscow State University, Department of Physics, Moscow, Russia, DMITRY LOPAEV, SERGEY ZYRYANOV, Nuclear Physics Institute, Moscow State University, Moscow, Russia, DMITRY ASTAKHOV, VLADIMIR KRIVTSUN, KONSTANTIN KOSHELEV, Institute of Spectroscopy RAS (ISAN), RD ISAN, Troitsk, Russia — Extreme Ultraviolet Lithography (EUVL) at 13.5 nm is expected to provide the next generation of ULSI. One of hot EUVL problems is contamination of EUV multilayer optics that compels to search methods of in-situ cleaning. The most promising method is to apply H2 plasma generated over the mirror surface by EUV radiation itself. Therefore investigations of EUV-induced plasma are of great interest for such cleaning technology developing. To model evolution of EUV-induced plasma, the study of H2 plasma induced by photoelectrons extracted from a surface by KrF laser pulse has been done. The experiment was carried out by the space-time resolved probe technique while the analysis was made with using plasma model based on 2D PIC MC code for both electrons and ions. Comparison of experimental and calculated evolution of probe characteristics provides correct applicability of the probe theory and allows one to reveal key mechanisms and parameters which control the evolution of photoelectrons-induced plasma.

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