

Abstract Submitted  
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**Space – time evolution of low-pressure H<sub>2</sub> plasma induced by runaway 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, KONSTANTIN KOSHELEV, VLADIMIR KRIVTSUN, DMITRY ASTAKHOV, Institute of Spectroscopy RAS (ISAN), R&D 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 H<sub>2</sub> plasma generated over the mirror surface by itself EUV radiation. Therefore investigations of EUV-induced plasma are of great interest for developing such cleaning technology. To model evolution of EUV-induced plasma, the study of H<sub>2</sub> 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 as for electrons and for ions. Comparison of experimental and calculated evolution of probe characteristics provided correct applicability of the probe theory and allowed revealing key mechanisms and parameters which control the evolution of photoelectrons-induced plasma.

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