

Abstract Submitted
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Development of a double plasma gun device for investigation of effects of vapor shielding on erosion of PFC materials under ELM-like pulsed plasma bombardment I. SAKUMA, D. IWAMOTO, Y. KITAGAWA, Y. KIKUCHI, N. FUKUMOTO, M. NAGATA, University of Hyogo — It is considered that thermal transient events such as type I edge localized modes (ELMs) could limit the lifetime of plasma-facing components (PFCs) in ITER. We have investigated surface damage of tungsten (W) materials under transient heat and particle loads by using a magnetized coaxial plasma gun (MCPG) device at University of Hyogo. The capacitor bank energy for the plasma discharge is 144 kJ (2.88 mF, 10 kVmax). Surface melting of a W material was clearly observed at the energy density of ~ 2 MJ/m². It is known that surface melting and evaporation during a transient heat load could generate a vapor cloud layer in front of the target material [1]. Then, the subsequent erosion could be reduced by the vapor shielding effect. In this study, we introduce a new experiment using two MCPG devices (MCPG-1, 2) to understand vapor shielding effects of a W surface under ELM-like pulsed plasma bombardment. The capacitor bank energy of MCPG-2 is almost same as that of MCPG-1. The second plasmoid is applied with a variable delay time after the plasmoid produced by MCPG-1. Then, a vapor cloud layer could shield the second plasma load. To verify the vapor shielding effects, surface damage of a W material is investigated by changing the delay time. In the conference, the preliminary experimental results will be shown.

[1] A. Hassanein et al., J. Nucl. Mater. **390-391**, pp. 777-780 (2009).

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