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## Nanostructure growth by helium plasma irradiation to tungsten in sputtering regime

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### Abstract

The formation of nanostructure on tungsten (W) surface due to Helium (He) plasma irradiation can be harmful for fusion reactors. Up to now, W nanostructure growth was investigated mainly without sputtering. Under sputtering regime, nanostructure growth competes with erosion of the nanostructured W layer due to sputtering. In this study, the nanostructure growth was investigated in the linear divertor simulator NAGDIS-II at incident ion energy of 200-500 eV. The growth of nanostructures was investigated by experiments and calculations under the sputtering regime. With increasing incident ion energy, the thickness of nanostructured W layer was saturated rapidly at a lower He fluence, resulting in thinner W nanostructured layer. The erosion rate of the top of the W nanostructured layer was obtained from the comparison with the numerical calculation.

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