**Impacts of impurity flux on erosion and deposition of carbon/tungsten rough surfaces**

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Experimental results in TEXTOR, JET and ASDEX Upgrade revealed a strongly inhomogeneous erosion-deposition distribution with large erosion on protruding parts of rough surface and smaller erosion or even deposition in recessions. The Monte-Carlo code SURO [1-4] has been used to study the influence of surface roughness on the impurity deposition characteristics in fusion devices. The properties of background plasma and impurity near the divertor target are studied by SDPIC modelling, which are used as the input data for SURO code. The SURO code uses the test particle approach to describe the bombardment of background plasma and the deposition of impurity particles on the three-dimensional (3D) surface topography. The dynamic change of surface topography as well as surface concentrations of different species due to erosion and deposition are taken into account in SURO, which has a very good flexibility for treating the process of material mixing.

In this work, the simulation of the deposition of carbon impurity on rough wall surfaces has been conducted with the rough surface code SURO. The temporal evolution of the net eroded substrate and deposited impurity areal densities has been studied under the low and high impurity fluxes. For the low impurity flux, the carbon and tungsten substrates maintain to be eroded during the exposure. The eroded areal density for the tungsten substrate is about $10^{10} \mu m^2$, which is two orders of magnitude lower than that for the carbon substrate. While for the high impurity flux, the tungsten and carbon substrates can be protected by the strongly deposited impurity which is eroded by the background plasma and impurity after the exposure of 1000 s. The areal densities of the deposited impurity and eroded substrate on rough wall surfaces are investigated with different carbon fluxes.