

Abstract Submitted
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Removal of carbon based deposits using microplasma jets SOREN BOYN, RICHARD CLERGEREAUX, FREDDY GABORIAU, LEANNE PITCHFORD, Laplace CNRS and Univ Toulouse, CLAIRE DOUAT, VINCENT PUECH, LPGP CNRS and Univ Paris-Sud — ITER is currently planning to use some carbon target tiles in the divertor. Modeling and experiments suggest that carbon-based deposits will accumulate, trapping tritium, and it will be necessary to remove such accumulations periodically. In this context, we are studying plasma-induced erosion of hydrogenated amorphous carbon (a-C:H) thin films. The plasma source (a few watts) is a microplasma jet generated application of fast-rising, high voltage pulses (up to 5 kV) at 10s of kHz. Pure He or He/O₂ mixtures flow through the tube into open air and the film is exposed to the plasma jet which extends several cm past the end of the tube. Ellipsometric measurements show that the film on Si substrate is totally removed over a width comparable to the jet diameter after 3 minutes. The erosion profile is conic and about 10 mm wide. In contrast, with a stainless steel substrate, the eroded surface is flat over a 6-7 mm diameter area. Possible reasons for the influence of the substrate will be discussed and a temporal study of the interaction between the plasma bullet and the a-C:H film deposited on different substrates will be presented.

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