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The dynamics of plasma surface interaction

In these simulations, dynamics of plasma surface interaction will be described. In the first part, we will introduce the low energy ion grazing scattering technique for characterization, in-situ and real-time, the plasma-surface interaction. The experimental results demonstrate that it is a viable tool for in-situ monitoring of the interaction of plasma with surfaces. In order to interpret the experimental data, MD simulations were performed to investigate the dynamics of CF grazing scattering from Si (100) surfaces. The translational energy loss of CF, the redistribution of the internal energy gained and the stereodynamics of surviving molecules are discussed.

In the second part, interactions of CF_3 with fluorinated silicon surfaces are discussed. In fluorocarbon plasma etching, the F-containing reaction layer plays an important role. Experiments show that, once steady-state etching is reached, removal of Si atoms proceeds through this layer.