



The first laboratory measurements of sulfur ions sputtering water ice

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The upcoming JUPiter ICy moons Explorer mission to Europa, Ganymede, and Callisto has renewed the interest in the interaction of plasma with an icy surface. In particular, the surface release processes on which exosphere models of icy moons rely should be tested with realistic laboratory experiments. We therefore use an existing laboratory facility for space hardware calibration in vacuum to measure the sputtering of water ice due to hydrogen, oxygen, and sulfur ions at energies from 1 keV to 100 keV. Pressure and temperature are comparable to surface conditions encountered on Jupiter's icy moons. The sputter target is a 1cm deep layer of porous, salty water ice. Our results confirm theoretical predictions that the sputter yield from oxygen and sulfur ions should be similar. Thanks to the modular set-up of our experiment we can add further surface processes relevant for icy moons, such as electron sputtering, sublimation, and photodesorption due to UV light.