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Hydrogen plasma interaction with graphite surface GILLES CARTRY, CEDRIC THOMAS, JEAN-MARC LAYET, THIERRY ANGOT, CNRS-Universite de Provence — Interaction of hydrogen with graphite surfaces is of great interest for controlled fusion, where carbon material erosion by hydrogen is a key issue. Indeed, tritium retention resulting from carbon redeposition is a safety problem. In this perspective, we study interaction between hydrogen plasma and graphite. We aim to understand erosion mechanisms and identify the role of ions and neutrals. In order to unravel all plasma-surface interaction mechanisms, we associated on a same ultra-high vacuum set-up, an ICP plasma source, an atomic hydrogen source and a hydrogen ion gun. Surface properties were probed with *in-situ* high-resolution electron-energy-loss spectroscopy (HREELS) and with *in-situ* scanning tunneling microscopy (STM). Comparison with DFT calculations leads us to establish the model of H adsorption process. Surface exposition to atomic hydrogen leads to relatively weak adsorption of H atoms. Surface exposition to 300eV H_2^+ ions leads to formation of defects without H adsorption. Subsequent H exposition shows the presence of strongly bonded H atoms. Plasma expositions reveal the presence of strongly bonded H atoms.

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