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Diagnostics of Pulsed Hydrogen Plasmas JEROME DUBOIS, GILLES CUNGE, OLIVIER JOUBERT, MAXIME DARNON, LAURENT VALLIER, Univ. Grenoble Alpes, CNRS, CEA-Leti, LTM, F-38000 Grenoble, France, NICOLAS POSSEME, CEA, LETI, MINATEC Campus, F-38054 Grenoble, France, ETCHING GROUP TEAM — Hydrogen plasmas present a great potential interest for new materials such as graphene or C-nanotubes. To modify or clean such ultrathin layers without damaging the material, low ion energy bombardment is required (conditions such as those obtained in pulsed ICP reactor). By contrast, for other applications the ion energy must be high, to get a significant etch rate for example. To assist the development of innovative processes in H2 plasmas, we have thus analyzed systematically CW and pulsed H2 plasmas both with and without RF bias power. In particular, we carry out time-resolved ion flux, and time-averaged ion energy measurements in different pulsing configurations. A large variety of ion energies and shapes of IVDF are reported depending on pulsing parameters. The IVDF are typically very broad (due to the low ion transit time of low mass ion through the sheath) and either bi or tri-modal (H+, H2+ and H3+ contributions). The time variations of the ion flux in pulsed plasmas also presents peculiar features that will be discussed. Finally, we show that a specific issue is associated to H2 plasmas: they reduce the chamber walls material therefore releasing impurities (O atoms…) in the plasma with important consequences on processes.

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