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P2.1034 SOLPS-ITER simulations of the GyM linear plasma device

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It is well-known that to investigate plasma wall interaction in ITER-relevant conditions both experimental and theoretical efforts are needed. Concerning the former aspect, linear plasma devices are usually adopted, being able to generate ITER-relevant plasmas. On the numerical aspect, dedicated codes have been developed by the fusion community addressing the modelling of edge plasmas (e.g. SOLPS [1]) and plasma material interaction (e.g. ERO [2]). Edge plasma codes are widely used for the modelling of present-day tokamak devices, but are scarcely applied to linear machines, despite their great importance in fusion research. To bridge this gap, in this contribution, we show the first results concerning the application of the newest version of SOLPS, SOLPS-ITER [4], to the medium-flux linear plasma device GyM [3]. Since this is one of the first applications of this code version to linear configurations, necessary code adaptations were first identified and implemented. Both Argon and Deuterium simulations were performed, varying the radial transport coefficients, pumping and power delivered to the plasma by the microwave source. Simulated radial profiles of the main plasma parameters (electron density, temperature and plasma potential) were compared with those available experimentally and to those obtained using the 5.1 version of SOLPS. In the former case, a good qualitative and quantitative agreement was obtained, whereas deviation in quantitative values of the electron density was observed in the latter. Following these promising results, we aim to use simulated SOLPS background plasmas for material codes such as ERO2.0 to help to interpret experiments performed in GyM, concerning the exposures of complex/rough nanostructured materials like those presented in [5].
[1] R. Schneider et al, Contrib. Plasma Phys. 46, No. 1-2, 3 191 (2006) [2] A. Kirschner et al, Nucl. Fusion 40 (2000) 989. [3] G. Granucci et al., 36th EPS Conference on Plasma Physics, 2009 [4] D. Dellasega et al., Poster contribution presented at PSI-23 [5] S. Wiesen. et al., J. Nucl. Mater. 463 (2015) 480, 21st PSI, Kanazawa, Japan, 2014.

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