Contribution ID: **3383**   Type: **not specified**

P4.1006 Algorithm of calculating the passive signal of tokamak edge plasma for CXRS diagnostics

Thursday, 11 July 2019 14:00 (2 hours)

See full abstract here
http://ocs.ciemat.es/EPS2019ABS/pdf/P4.1006.pdf

Predictive modeling of passive signal of tokamak edge plasma charge-exchange recombination spectroscopy (CXRS) diagnostics remains a problem because of the necessity to combine solutions of theoretical problems, which need sophisticated numerical modeling. This includes: (i) modeling of the SOL(+divertor) plasma with account of impurities to be diagnosed with the Edge-CXRS diagnostics (such data are accumulated and being extended; for ITER see, e.g., the SOLPS (B2-EIRENE) [1] and OSM+EIRENE+DIVIMP [2] simulations); (ii) cross-sections of charge exchange reactions, which produce highly-excited atomic states of H-like impurity ions from collisions of impurity nuclei with hydrogen isotopes neutral atoms (including their low-lying excited states) of background plasma; (iii) the rates of the above-mentioned reactions for essentially non-Maxwellian velocity distributions function (VDF) of hydrogen isotopes neutral atoms (the VDF data may be generated, e.g., by stand-alone EIRENE code [3] simulations using the background SOL plasma data); (iv) the photon emission coefficients (PEC) data for interested impurity visible-light spectral lines in the case "iii" which is beyond the available data in ADAS and similar sources (these data may be generated, e.g., with the code [4], similarly to evaluation of active CXRS signal in [5]). Here we describe the algorithm of modeling the passive signal of edge-CXRS diagnostics in tokamaks, which uses the data (i)-(iv). Some preliminary results for passive signal of the ITER Edge CXRS diagnostics are presented.

References
[1]. Kukushkin A.S., et al., Fusion Eng. Des. 86, 2865 (2011). [2]. Lisgo S. W. et al., J. Nucl. Mater., 415, 965 (2011). [3]. Reiter D., et al. Fusion Sci. Technol., 47, 172 (2005). [4]. M.B. Kadomtsev, M.G. Levashova, V.S. Lisitsa, JETP 106 (2008) 635-649. [5]. Tugarinov S.N. et al. 36th EPS Conf. Plasma Phys. Sofia, 2009 ECA Vol. 33E, P-5.214 (2009)

Presenter: SDVIZHENSKII, P.A. (EPS 2019)

Session Classification: Poster P4

Track Classification: MCF