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8.25 Application of the VUV and the soft X-ray systems on JET for the study of intrinsic impurity behavior during neon seeded ILW hybrid discharges

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A series of experiments carried out with Ne seeding on JET with the ITER-like-Wall (ILW) suggests increased tungsten release and impurity accumulation as consequences of Ne seeding. For this reason, a detailed study of impurity behaviour together with its control during light gas injection is required. This paper reports on impurity behaviour in a set of hybrid discharges with Ne using the method, which relies on the measurements collected by VUV and soft X-ray diagnostics including the Princeton Instruments survey SPRED spectrometer and the SXR cameras system. Both diagnostics have some limitation. SXR analysis is performed when $T_e > 1.5\text{--}2\text{ keV}$ and it is not clear what species in the plasma are responsible for this radiation, while VUV due to vertical line of sight (LOS) loses most of tungsten radiation. Consequently, only a combination of measurements from these systems are able to provide comprehensive information about high-Z (e.g. tungsten (W)) and mid-Z (Ni, Mo) impurities for their further quantitative diagnosis. Moreover, thanks to the large number of the SXR LOS, determination of 2D radiation profile was also possible. Additionally, experimental results were compared with numerical modelling based on integrated simulations with COREDIV.

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