

Joint IAEA-FZJ Technical Meeting on the Collisional-Radiative Properties of Tungsten and Hydrogen in Edge Plasma of Fusion Devices

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Needs of atomic data for kinetic modelling of fusion plasma edge

Wednesday, 31 March 2021 13:45 (30 minutes)

Presentation consist of two parts. First we discuss the effects of non-Maxwellian velocity distribution functions (VDF) on effective plasma-neutral and plasma impurity (W, Ar) interaction rates. It will be shown, that in the stationary SOL the rates of electron-impact processes (e.g. W, W⁺ ionization) well agree with the Maxwell averaged values. The exception is plasma sheath where the cutoff in electron VDF introduces some deviations. Contrary to this, the rates of ion-neutral interactions might significantly deviate from the Maxwell averaged values. In the ELM-ing SOL the majority of plasma-impurity and plasma-neutral interaction rates differ from the Maxwell-averaged values.

In the second part of the presentation we discuss needs for atomic data for kinetic modelling and consider new technique, “dressed” cross sections, for kinetic treatment of multichannel atomic processes using collisional-radiative model.

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