

ATOM-ATOM AND ION-ATOM COLLISIONAL PROCESSES: MODELING OF STELLAR ATMOSPHERES

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We present the results obtained during our long-term research (see e.g. Mihajlov et al. 2011, 2003, Srećković et al. 2013, 2014) on the influence of two groups of collisional processes (atom-atom and ion-atom) on the optical and kinetic properties of weakly ionized stellar atmospheres layers. The first type includes radiative processes of the photodissociation/association and radiative charge exchange, the second one the chemi-ionisation/recombination processes. The effect of the radiative processes is estimated by comparing their intensities with those of the known concurrent processes in application to the solar photosphere and to the photospheres of DB white dwarfs. The investigated chemi-ionisation/recombination processes are considered from the viewpoint of their influence on the populations of the excited states of the hydrogen atom (the Sun and an M-type red dwarf) and helium atom (DB white dwarfs). The effect of these processes on the populations of the excited states of the hydrogen atom has been studied using the general stellar atmosphere code, which generates the model. The presented results demonstrate the undoubted influence of the considered radiative and chemi- ionisation/recombination processes on the optical properties and on the kinetics of the weakly ionized layers in stellar atmospheres.

References

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