Poster

THE CROSS SECTIONS AND THE RATE COEFFICIENTS OF THE FREE-FREE ABSORPTION PROCESSES IN STELLAR ATMOSPHERES

V. A. Srećković[1], M. S. Dimitrijević[2,3], Z. Simić[2] and N. M. Sakan[1]

[1]*Institute of Physics, Pregrevica 118, 11080 Zemun, Belgrade, Serbia*
[2]*Astronomical Observatory, Volgina 7, 11060 Belgrade, Serbia*
[3]*LERMA, Observatoire de Paris, UMR CNRS 8112, UPMC,*
92195 Meudon Cedex, France
E-mail: vlada@ipb.ac.rs, mdimitrijevic@aob.rs, nsakan@ipb.ac.rs

The contribution of free-free electron-ion processes to the total absorption in stellar atmospheres increases with density, and for very dense plasmas it becomes dominant. Consequently, it is of interest to investigate the role of such processes in deeper layers, and to examine its influence on radiative transfer through such layers. In this contribution we present the free-free i.e. electron-ion characteristics for the case of the various models of stelar atmospheres where such plasma characteristics as plasma density and temperature change in wide region. It is shown that determination of these characteristics such as the cross-sections and the rate coefficients can be successfully performed in the whole diapason of electron densities and temperatures which is relevant for the corresponding non-ideal, dense astrophysical plasma. The Cut-off form of Coulomb potential is used to approximate the shielding effect in order to derive the cross-sections and the rate coefficients. We used quantum mechanical method of the calculation of the investigated characteristics (see Mihajlov et al. 2015). The results are obtained for the DB White dwarf models (Koester 2015 private communication) and for the solar model of Vernazza et al. (1981) in the wavelength region 10 nm $< \lambda <$ 3000 nm. Also, these results can be of interest and use in investigation of different laboratory non-ideal, dense plasmas.

References

Mihajlov, A. A., Srećković, V. A., Sakan, N. M.: 2015, *J. Astrophys. Astr.*, **36**, 635-642.
Vernazza, J., Avrett, E., Loser, R.: 1981, *ApJS*, **45**, 635.