Poster

A NEW ANALYSIS OF STARK AND ZEEMAN EFFECTS ON HYDROGEN LINES IN MAGNETIZED DA WHITE DWARFS

N. Kieu[1], J. Rosato[1], R. Stamm[1], J. Kovačević-Dojčinović[2], M. S. Dimitrijević[2], L. Č. Popović[2] and Z. Simić[2]

[1] *Aix-Marseille Université, CNRS, PIIM UMR 7345, 13397 Marseille Cedex 20, France*
[2] *Astronomical Observatory, Volgina 7, 11060 Belgrade 38, Serbia*

E-mail: joel.rosato@univ-amu.fr

White dwarfs with magnetic field strengths larger than 10 T are understood to represent more than 10% of the total population of white dwarfs (Külebi et al. 2009). The presence of such strong magnetic fields is clearly indicated by the Zeeman triplet structure visible on absorption lines. An analysis of line shapes also yields information on the plasma parameters (density and temperature) in the atmosphere, provided a suitable line broadening model accounting for the plasma microfield (Stark broadening) is used. In this work, we discuss the line broadening mechanisms and focus on the sensitivity of hydrogen lines on the magnetic field. The role of quadratic Zeeman effect on the position of absorption lines is discussed. At strong magnetic field values, the Lorentz electric field $\mathbf{v} \times \mathbf{B}$ is important and it can enter in competition with the plasma microfield. We perform new calculations in conditions relevant to DAH stellar atmospheres using models inspired from magnetic fusion plasma spectroscopy (Rosato et al. 2017). A selection of spectra from the Sloan Digital Sky Survey (SDSS) database (Külebi et al. 2009, Kepler et al. 2013) are analyzed.

References

Kepler, S. O. et al.: 2013, *Mon. Not. R. Astron. Soc.*, **429**, 2934.
Külebi, B. et al.: 2009, *Astron. Astrophys.*, **506**, 1341.
Rosato, J. et al.: 2017, these proceedings.