

STARK WIDTHS OF Na IV SPECTRAL LINES

M. S. Dimitrijević¹, Z. Simić¹, A. Valjarević² and C. Yubero³

¹*Astronomical Observatory, Volgina 7, 11060 Belgrade 38, Serbia*

²*University of Kosovska Mitrovica, Faculty of Natural Sciences and Mathematics, Department of Geography, Ive Lole Ribara 29, 38220 Kosovska Mitrovica, Serbia*

³*Grupo de Física de Plasmas: Diagnósis, Modelos y Aplicaciones (FQM-136), Universidad de Córdoba, Edificio A. Einstein (C-2), Campus de Rabanales, 14071 Córdoba, Spain*

E-mail: mdimitrijevic@aob.rs, zsimic@aob.rs, aleksandar.valjarevic@pr.ac.rs, f62yusec@uco.es

Sodium is a very important element for research and analysis of astrophysical, laboratory and technological plasmas but neither theoretical nor experimental data on Stark broadening of Na IV spectral lines are present in literature.

Using the modified semiempirical method (Dimitrijević and Konjević, 1980), here have been calculated Stark widths for 13 Na IV transitions. Na IV belongs to the oxygen isoelectronic sequence and we have calculated Stark widths belonging to singlets, triplets and quintuplets as well as with different parent terms. This is used to discuss similarities within one spectrum with different multiplicities and parent terms.

Additionally, calculated widths will be implemented in the STARK-B database (Sahal-Bréchet et al., 2015 - <http://stark-b.obspm.fr>) which is also a part of Virtual atomic and molecular data center (VAMDC - <http://www.vamdc.org/> - Dubernet et al. 2010).

References

- Dimitrijević, M. S. and Konjević, N.: 1980, Stark widths of doubly- and triply-ionized atom lines, *Journal of Quantitative Spectroscopy and Radiative Transfer*, **24**, 451.
- Dubernet, M. L., Boudon, V., Culhane, J. L., Dimitrijević, M. S., Fazliev, A. Z. et al.: 2010, Virtual atomic and molecular data centre, *Journal of Quantitative Spectroscopy and Radiative Transfer*, **111** (15), 2151–2159.
- Sahal-Bréchet, S., Dimitrijević, M. S., Moreau, N., Ben Nessib, N.: 2015, The STARK-B database VAMDC node: a repository for spectral line broadening and shifts due to collisions with charged particles, *Physica Scripta*, **50**, 054008.