

## A PROGRAMME TO PROVIDE STARK BROADENING DATA FOR STELLAR AND LABORATORY PLASMA INVESTIGATIONS

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In order to provide the needed Stark broadening parameters for investigation and modeling of stellar and laboratory plasmas, an effort to obtain the corresponding data for all transitions with the sufficiently complete set of atomic energy levels is in course. Using the semiclassical perturbation method (Sahal-Bréchet, 1969ab) extensive calculations for 79 neutral helium multiplets, 62 Na, 51 K, 61 Li, 25 Al, 24 Rb, 3 Pd, 19 Be, 270 Mg, 28 Ca II, 30 Be II, 23 Al III, 10 Sc III, 10 Ti IV, 39 Si IV, 90 C IV, 5 O IV, 19 O V, 30 N V, 30 O VI, 21 S VI, 10 F VII, 20 Ne VIII, 8 Na IX, 7 Al XI and 9 Si XII multiplets become available and additional data for Li II, Mg II, C V and P V are in preparation. Data for particular lines of F I, Ar II, Ga II, Ga III, Si II, Cl I, Br I, I I, Cu I and Hg II also exist. Our intention is to cover all radiators where a sufficiently complete set of reliable atomic data exists and where the additional effects influencing on calculations like *e.g.* relativistic effects may be neglected. When the semiclassical method is not applicable or is applicable only with smaller accuracy due to the lack of relevant atomic data, our intention is to supply the corresponding Stark broadening data obtained by using the modified semiempirical approach (Dimitrijević and Konjević, 1980).

Here is presented a review of available semiclassical calculations of Stark broadening parameters and comparison of different semiclassical procedures is discussed, as well as the agreement with critically selected experimental data and more sophisticated, close coupling calculations. The modified semiempirical approach, useful especially in such astrophysical problems where large scale calculations and analyses must be performed and where a good average accuracy is expected, has also been discussed as well as his applications. We discuss as well the criteria used for selection of radiator spectra for analysis and the future development of the programme.

### References

- Sahal-Bréchet, S. : 1969, *Astron. Astrophys.* **1**, 91.  
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 Dimitrijević, M. S., Konjević, N. : 1980, *JQSRT*, **24**, 451.