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Poster paper

TEMPERATURE DEPENDENCE OF NON HYDROGENIC ATOM-LINES STARK WIDTHS

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We investigate in the present work the temperature dependence of Stark widths for neutral atom spectral lines in order to find a more precise method for scaling with temperature than sometimes used dependence $T^{-1/2}$, which is often inadequate particularly for Stark broadening of neutral emitter lines.

We propose here a method which provides better possibilities for scaling with temperature. In order to demonstrate the applicability of this scaling, we have applied it to Stark line widths of He I, Mg I, and Ar I. The present results concerns the data at a perturber density $10^{16} cm^{-3}$ and (temperature = 2.510^3 - 5.010^4 K).

In order to obtain a better method for the scaling of Stark broadening parameters with temperature we have used formulae for estimating Stark widths of neutral atom lines based on the simple method of Freudenstein and Cooper and its generalization (i) for the cases where there are more than one important perturber level and (ii) for the shifts, by Dimitrijević and Konjević.

We present results for temperature scalings of Stark half-halfwidths with the proposed method, which are compared with width calculations according to the semiclassical perturbation formalism (versions of Sahal-Bréchot and Griem, Baranger, Kolb and Oertel)and with results obtained with symplified methods of Freudenstein and Cooper, and of Dimitrijević and Konjević.