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Progress Report

A NEW METHOD TO FIT LINE PROFILES FROM PLASMA WITH A SUM OF VOIGT PROFILES

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In recent years, Atomic Emission Spectroscopy techniques have been shown to be an excellent tool to determine plasma characteristic magnitudes. Among atomic emission lines, Hydrogen Balmer series lines are the most used. These lines are the result of the internal processes contributing to the total width of a spectral line in an independent manner. While most of these processes can be described in terms of analytical functions, this is not the case of the Stark broadening of Hydrogen lines, because of joint action of electrons and ions which influence differently due to large difference in masses. To date, analytical functions have been proposed for the Stark profiles of the H_α line and for the H_β line (Díaz-Soriano et al. 2018a,b). These functions are convoluted with those of the other internal processes in order to compare with the experimental profile. However, this procedure requires a large amount of computational effort. In this paper, a new fit procedure for line profiles from plasma has been proposed, based on the presentation of the experimental profile as a sum of Voigt profiles, which are computed by means of the Faddeeva function.

References

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