Poster paper

EXPERIMENTAL AND THEORETICAL STARK WIDTHS FOR Au II

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In the present work, we have studied experimentally and theoretically the Stark widths from several lines of Au II, and, some of them not measured before. The interest in Au II resides not only on the knowledge of its atomic structure to check the adequacy of theoretical models, but also on its astrophysical importance because it contributes to the opacity in spectra of chemically peculiar stars (Leckrone et al. 1993).

The plasma source of Au II spectrum was produced by laser ablation on pure gold. Due to the effects of self-absorption, some isolated lines were ruled out. The neutral atom and other higher ions from gold were present in the plasma. The experimental work was performed in the facility provided by UCM and employed the Laser Induced Breakdown Spectroscopy (LIBS) technique. A Nd:YAG laser beam focused on the surface of the target was used to generate the plasma in a controlled argon atmosphere. The light emitted by the laser-produced plasma was focused on the input slit of a grating monochromator (1-m Czerny-Turner, 16pm resolution in second order), which was coupled with a time-resolved optical multichannel analyzer system (OMA III, EG&G). The experimental plasma conditions were obtained from a Boltzmann plot of the temperature and by means of the Saha equation. Experimental branching ratios and already published data for transition probabilities were used for this purpose.

The theoretical results were obtained using the semiclassical perturbation approach (Sahal-Bréchot 1969ab) and the modified semiempirical approach (Dimitrijević and Konjević 1980). Obtained experimental and theoretical results were compared and discussed.

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References:

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