

# Reanalysis and semi-empirical predictions of the hyperfine structure of $^{123}\text{Sb I}$

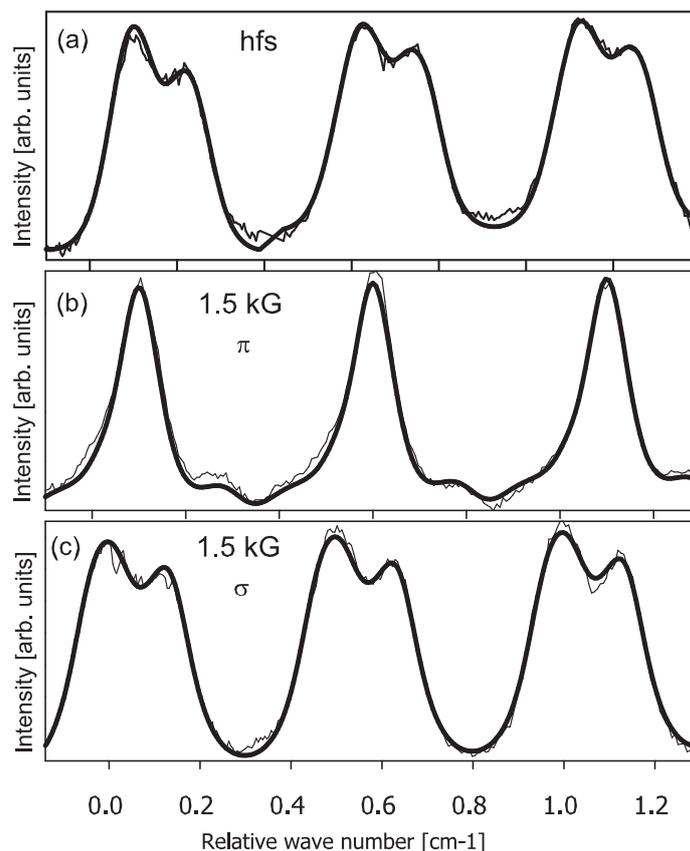
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The hyperfine and Zeeman structures of 14 lines of  $^{123}\text{Sb I}$  covering the UV-NIR spectral range have been examined. The Zeeman effect studies were performed for transverse direction of observation and separated  $\pi(\Delta M = 0)$  and  $\sigma(\Delta M = \pm 1)$  components of lines. The complete set of fine structure parameters of the two level parities are determined, discarding some levels, previously mentioned in literature [1]. Furthermore we give those missing up to  $70000 \text{ cm}^{-1}$ . New Landé-factors and hyperfine structure (hfs) constants of 12 odd- and 6 even- parity levels of  $^{123}\text{SbI}$  were measured and the single-electron hfs parameters, treated as free in the least squares fit to these measured hfs constant values were extracted. We give the 3 main deduced values:  $a_{6s}^{10} (5p^26s) = 49.09 \text{ mK}$ ,  $a_{5p}^{01} (5p^26s) = 29.63 \text{ mK}$ ,  $a_{5p}^{01} (5p^3) = 27.63 \text{ mK}$  Finally a complete list of the predicted hfs constant A of all studied system levels was generated.



**Figure 1:** The recorded hyperfine structure of the 792.5 nm line of  $^{123}\text{Sb I}$  (a) and Zeeman patterns  $\pi$ -view (b) and  $\sigma$ -view (c) at 1.50 kG magnetic field. The thin line represents the experimental trace and the thick line shows the computer-generated contour.

## References

[1] Hassini F, Ben Ahmed Z., Robaux O., Verges J. and Wyart J.F. (1988) JOSA B5, 2060