

The Quantum Spectral-Model and Humphreys α -Multiplet Spectral Composition in H-I Spectrum

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Abstract :

Starting from the quantum model of the hydrogen atom, we calculate and tabulate the peaks of α Humphreys-multiplet in fine-structure approximation (*fs*-approximation) [1,2]. We determine the spectral line peaks of this multiplet using a new *MaximumLocalisation*-spectral-Model which is based on some several spectroscopic and statistical hypotheses [2-4]. By statistical analysis of the NIST and ACE data, we evaluate the parameters of the regression curves for the multiples of *Lyman..Pfund* and *Humphreys* spectral series (Fig.1). Furthermore, an algorithm for the quantum spectral reconstruction of multiplets in *fs*-approximation for any S_n spectral series of H-I is provided, n being the order of the spectral series. A plot representation is used to give a statistical global view of the first six series of H-I spectrum. The results confirm the measurements provided of the solar data from ACE mission [5].

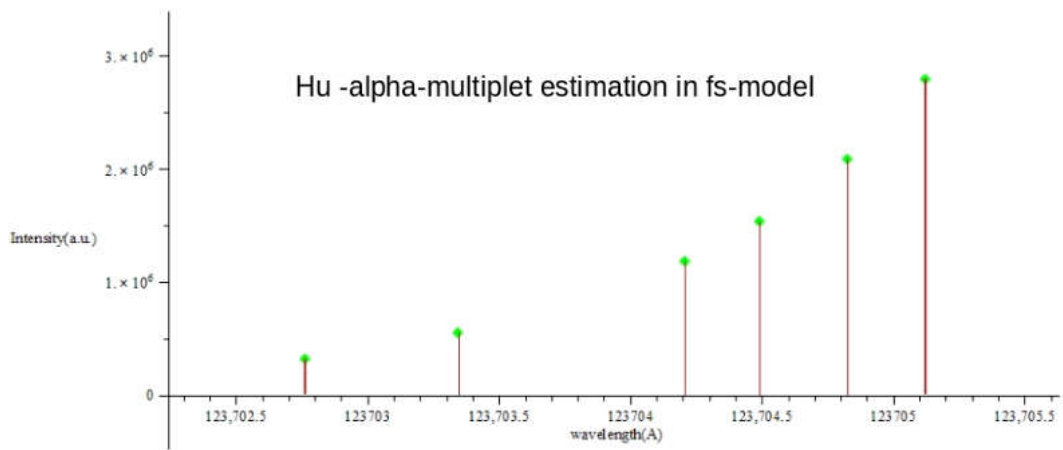


Fig 1. Plot of α Humphreys multiplet in fine-structure approximation in (λ, I) space.

Keywords: Humphreys series, solar data, NIST, spectral model, algorithm, statistics-regression.

Sections : S06 , S04

Reference :

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