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## Quantum studies of cesium $6p \leftarrow 6s$ far wing photoabsorption spectra colliding with ground neon atoms

The analysis of the far wings spectral broadening of the alkali D1 ( $np\ 2P_{1/2} - ns\ 2S_{1/2}$ ) and D2 ( $np\ 2P_{3/2} - ns\ 2S_{1/2}$ ) lines provoked by interaction with rare gas atoms prove their importance in design and construction of new types of lasers as well as in the investigation of the chemical and physical properties of brown dwarfs and extrasolar planets.

This work deals with the pressure broadening of the D1 and D2 lines of the Cs ( $6p \leftarrow 6s$ ) atoms in its far wings induced by Ne ( $2s^2 2p^6$ ) atoms. The needed potential-energy curves and the corresponding transition dipole moments are constructed upon purely ab-initio data points. This full quantum calculation demonstrates an important effect of temperature on the far wings and revealed that the CsNe photoabsorption spectra display one satellite structure in the blue side at wavelength 824nm. The obtained results are compared with the previous experimental measurements and theoretical works.

Keywords: potentials energy curves, pressure broadening, absorption coefficient, satellite structure.

### Affiliation de l'auteur principal

Université d'annaba.

**Auteurs principaux:** M. MOHAMMED TAHAR, Bouazza (université d'Annaba, Algérie); Dr LAMOUDI, Nora (Université D'annaba); Mlle KESSENTINI, Nour El houda (Université D'annaba)

**Orateur:** M. MOHAMMED TAHAR, Bouazza (université d'Annaba, Algérie)

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