

NS super-excited molecular states in the collision of electrons with NS+ cation

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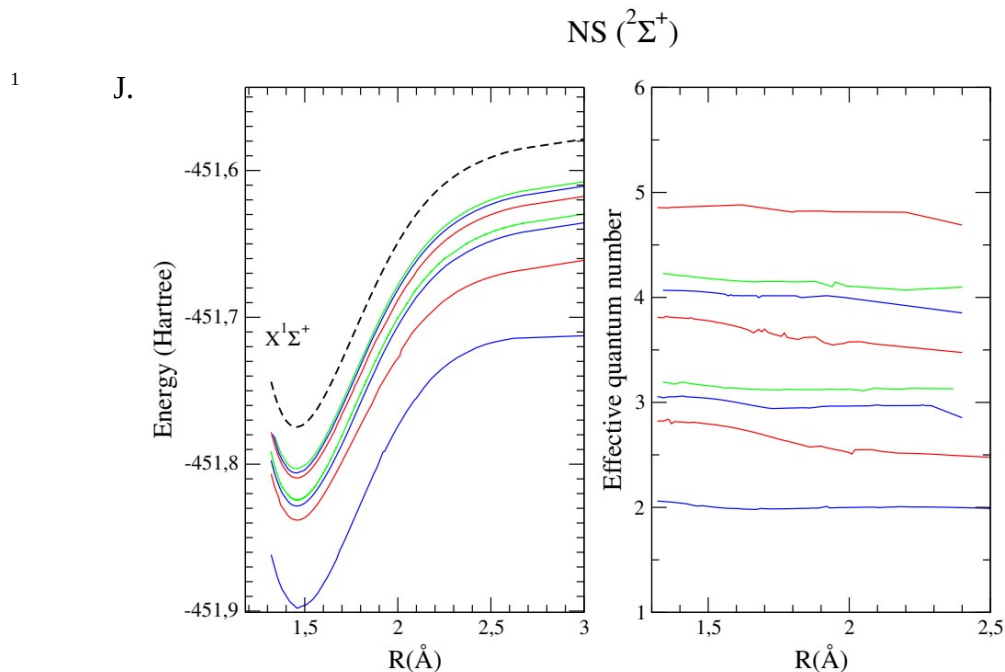
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The recent discovery of the NS+ cation in the interstellar medium¹ triggered the interest in the study of its collision with electrons. In this complex process, the electron can be captured into NS Rydberg-bound states predissociated by Feshbach resonances of this latter molecule. These both types of states have been calculated within the Born-Oppenheimer approximation using a variational ab-initio method based on the the R-matrix theory². The electronically-excited Rydberg states form series converging either to the ground or to the excited states of the cation. We will focus on the Rydberg series of $2\Sigma^+$ symmetry converging to the ground $X^1\Sigma^+$ state of the ion, conveniently characterized by their quantum defects or effective quantum numbers – see Figure 1.



Cernicharo et al, (2018) Ap.J.L, 853 L22

² J. Tennyson, Phys. Rep. 491, 29 (2010)