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ELECTRON NS^+ COLLISIONS IN COLD PLASMA

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Abstract. The recent discovery of the NS+ cation in the interstellar medium[1] 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 R-matrix theory[2]. They have a large contribution to the appearance of the cross section.

The purpose of this presentation is to show how the states were determined and to provide an accurate cross-section of the collisional process.

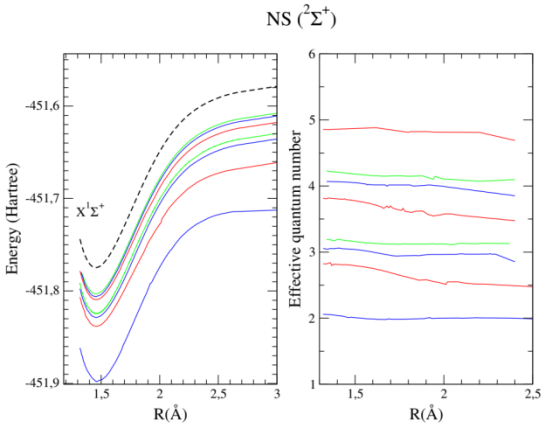

Figure 1: The bound states of the captured electron forming the NS neutral in left panel, and the quantum defects in right panel[3].

References

[1] J. Cernicharo et al, (2018) Ap.J.L, **853** L22
[2] J. Tennyson, Phys. Rep. 491, 29 (2010)
[3] F Iacob et al, (2022) J. Phys. B: Atomic, Molecular and Optical Physics **55** (23), 235202