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

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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 variationa ab-initio method based on the the R-matrix theory. 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 2Σ + symmetry converging to the ground X1 Σ + state of the ion, conveniently characterized by their quantum defects or effective quantum numbers.

Primary authors: IACOB, Felix-Iosif (West University of Timisoara, Romania); MEZEI, Zsolt (Institute for Nuclear Research (ATOMKI), H-4001 Debrecen, Hungary); SCHNEIDER4, Ioan (LOMC CNRS-UMR6294, Université Le Havre Normandie, F-76058 Le Havre, France); TENNYSON, Jonathan (University College London, WC1E 6BT London, UK); MELTZER, Thomas (Institute of Theoretical Physics, Charles University, 11636 Prague, Czech Republic)

Presenter: IACOB, Felix-Iosif (West University of Timisoara, Romania)

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