

## **Influence of nuclear spin conversion of H<sub>2</sub> molecules on the chemistry of the interstellar medium - Experiment and modelling**

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Water, molecular hydrogen, and other hydrogenated molecules or their deuterated isotopologues exist in several nuclear spin configurations due to the Pauli exclusion principle. Those configurations are called ortho (parallel proton spins) and para (antiparallel proton spins). The ortho-to-para ratio (OPR) of those molecules is widely studied in various astrophysical objects (molecular clouds, comets, protoplanetary disks, diffuse clouds, photon-dominated regions PDR, ...). The values found are often different from those expected and the interpretations are still speculative [1,2]. For the molecular hydrogen, chemical models in gas phase were elaborated [3,4] to describe astrophysical medium and their evolutions [5]. The ices coating interstellar grains could have a great impact on the ortho-to-para ratio of H<sub>2</sub> in PDR [6]. To have a better understanding of those phenomena, we want to integrate in the Meudon PDR code the gas phase chemical network of Grenoble (UGAN) who takes into account the ortho/para aspect of the species. Work has already been done on the nuclear spin conversion of H<sub>2</sub> on cold surfaces but the results are quite disparate [7,8,9]. We want to bring to light the nuclear spin conversion time of H<sub>2</sub> on iced grains according to the temperature to integrate those results in interstellar clouds models.

### **References**

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