



**HAL**  
open science

# ATOMIC AND MOLECULAR DEUTERIUM DENSITIES IN A PULSED RF DISCHARGE USING VUV ABSORPTION SPECTROSCOPY

Nelson de Oliveira, Laurent Nahon, Stéphane Béchu, M Mitrou

► **To cite this version:**

Nelson de Oliveira, Laurent Nahon, Stéphane Béchu, M Mitrou. ATOMIC AND MOLECULAR DEUTERIUM DENSITIES IN A PULSED RF DISCHARGE USING VUV ABSORPTION SPECTROSCOPY. The 27th International Conference on High-Resolution Molecular Spectroscopy Bologna, Italy, September 2–6, 2024, Sep 2024, Bologna (ITALY), Italy. pp.118. hal-04780405

**HAL Id: hal-04780405**

**<https://hal.science/hal-04780405v1>**

Submitted on 13 Nov 2024

**HAL** is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

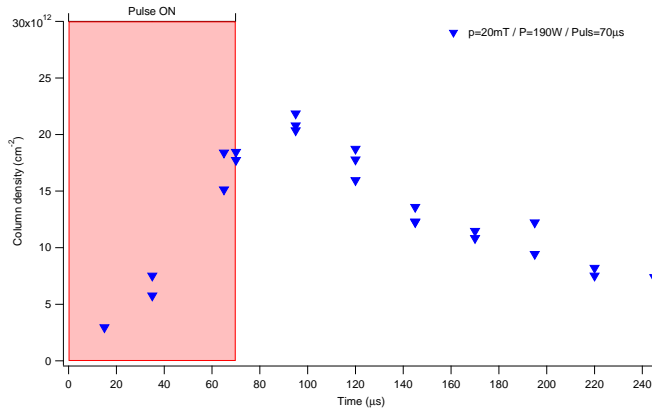
L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.

## ATOMIC AND MOLECULAR DEUTERIUM DENSITIES IN A PULSED RF DISCHARGE USING VUV ABSORPTION SPECTROSCOPY

**N. DE OLIVEIRA, L. NAHON**, *Synchrotron SOLEIL Ligne DESIRS, L'Orme des Merisiers Départementale 128 - 91190 St Aubin (France)*;  
**S. BECHU, M. MITROU**, *Laboratoire de Physique Subatomique et de Cosmologie, 53 Avenue des Martyrs 38026 Grenoble Cedex (France)*

The VUV-FTS (Vacuum Ultra-Violet Fourier Transform Spectrometer) is in operation on the DESIRS beamline since 2008[1]. This unique endstation combines broad band and high spectral resolution over a large UV-VUV spectral range from 300 nm down to 40 nm[2]. Recently, a new detection scheme has been installed in order to study kinetics formation and decay of transient species using absorption spectroscopy.

Recombinative desorption followed by dissociative electron attachment of excited  $D_2$  could provide an efficient mechanism for the production of  $D^-$ . An important application of this process would be the neutralisation of the highly energetic ions produced in hot plasma, aiming at decreasing the power load on the divertor targets in tokamak[3]. The lifetime of the produced transient species inside a pulsed RF discharge has been measured in absorption using the VUV-FTS. Those data could bring valuable quantitative information for the modelisation of such complicated environments.



**Keywords** — combustion and plasma diagnosis, instrumental technique demonstration, small molecules, synchrotron, visible/UV/X-ray, intensities

### References

- [1] L. Nahon, N. de Oliveira, G. Garcia, *et al.*, *J. Synchrotron. Rad.* **19**, 508 (2012).
  - [2] N. de Oliveira, M. Roudjane, D. Joyeux, *et al.*, *Nat. Photon.* **5**, 149 (2011).
  - [3] S. Béchu, J.L. Lemaire, L. Gaviland, *et al.*, *J. Quant. Spectrosc. Radiat. Transf.* **257**, 107325 (2020).
-