

MOLECULAR STRUCTURE ELUCIDATION AND BEYOND WITH MICROWAVE ROTATIONAL SPECTROSCOPY

Wednesday 6 September 2023 11:10 (25 minutes)

Since the dawn of the chirped-pulse era [1], rotational spectroscopy emerged as an outstanding tool for structure-solving, enabling novel exploratory approaches with unprecedented tracing capabilities [2]. The enhanced sensitivity and broadband capabilities of chirped-pulse microwave spectroscopy unlocked investigations into increasingly intricate molecular species [3], including notable examples such as artificial molecular motors [4]. Leveraging the inherently narrow line widths of rotational transitions, microwave spectra are unique molecular fingerprints, facilitating unambiguous determination of precise three-dimensional structures and even enabling identification and quantification of enantiomers through recently developed strategies [5,6]. In this contribution, we will discuss recent findings showcasing the wide-ranging applications of broadband rotational spectroscopy, in the realm of molecular structure elucidation and beyond.

References

- [1] G. G. Brown, B. C. Dian, K. O. Douglass, S. M. Geyer, S. T. Shipman, B. H. Pate, *Rev. Sci. Instrum.* 2008, 79, 053103.
- [2] S. R. Domingos, C. Pérez, M. Schnell. *Annu. Rev. Phys. Chem.* 2018, 69, 499-519.
- [3] S. R. Domingos, C. Pérez, N. M. Kreienborg, C. Merten, M. Schnell. *Commun. Chem.* 2021, 4, 32.
- [4] S. R. Domingos, A. Cnossen, W. J. Buma, W. R. Browne, B. L. Feringa, M. Schnell, *Angew. Chem. Int. Ed.* 2017, 56, 11209-11212.
- [5] D. Patterson, M. Schnell, J. M. Doyle. *Nature* 2013, 497, 475-477.
- [6] B. H. Pate, L. Evangelisti, W. Caminati, Y. Xu, J. Thomas, D. Patterson, C. Pérez, M. Schnell. *Chiral Analysis*, Elsevier, 2018, 679-729.

Author: DOMINGOS, Sérgio (CFisUC, Department of Physics, University of Coimbra, Coimbra 3004-516, Portugal)

Presenter: DOMINGOS, Sérgio (CFisUC, Department of Physics, University of Coimbra, Coimbra 3004-516, Portugal)

Session Classification: Invited talks