

Molecular spectroscopy in gas phase: a powerful tool for environment studies



Sylvain Léonis¹, Loïc Trompet^{1,2}, Bastien Vispoel³, Olivier Browet¹, and Muriel Lepère¹

1: Research Unit Lasers and Spectroscopies (LLS) – Physics Departement, Institute of Life, Earth and Environment (ILEE), University of Namur 2 : Planetary Aeronomy Division of Royal Belgian Institute for Space Aeronomy (BIRA-IASB)

3: Department of Environmental, Earth, and Atmospheric Sciences, University of Massachusetts, Lowell, USA





Wavenumber

Wavenumber

Wavenumber: $\tilde{\nu} (\text{cm}^{-1}) = \frac{1}{\lambda (\text{cm})} \Rightarrow \text{notation } \nu \text{ or } \sigma$ $1000 \text{ cm}^{-1} \leftrightarrow 10 \text{ }\mu\text{m}$ $3000 \text{ cm}^{-1} \leftrightarrow 3 \mu \text{m}$

Infrared radiation

 $\lambda \in [1 - 25] \, \mu m$ $\sigma \in [10,000 - 400] \,\mathrm{cm}^{-1}$



Absorption lines depending on the gas sample (molecules, partial pressures, temperature)

Line profiles

Spectroscopic parameters

- Positions of lines in wavenumbers
- Intensities of lines
- Widths of lines
- ...









