

Séminaire SOLEIL

Photodissociation dynamics of biomolecules using VUV ionization and of small molecules using ultra-short intense laser fields

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Invité par Catalin MIRON

Lundi 22 mars à 14h00**Grand Amphi SOLEIL**

Séminaires

Using vacuum ultraviolet light (VUV) as an universal and soft ionization method allows to detect polyatomic photofragments, which are fragile against multiphoton ionization and complicated in spectroscopic identification. One kind VUV laser application for such studies will be presented in this seminar: Multi-mass ion imaging technique, which aims to study the photodissociation dynamics of aromatic and bio-molecules. Two topics will be discussed: (I) the photoisomerization of simple aromatic molecules through seven-membered ring mechanism [1]; (II) The deactivation of UV excited biomolecules (DNA bases, amino acids and their chromophores) through repulsive $\pi\sigma^*$ states along with the N-H/O-H bond to account for the ultrafast decay pathway (so-called "photostability") [2].

The ultra-intense and ultra-short light sources have been applied to the studies of photodissociation dynamics process recently. Two types of experiments will be discussed: (I) Probing the nuclear dynamics of molecules in intense laser fields (800 nm, 1.3×10^{15} W/cm²) by coincidence momentum imaging has been conducted to seek the feasibility to visualise the "Roaming atom" pathway discovered in the UV photodissociation of H₂CO [3]; (II) Multiple ionization studies of atoms and molecules in the EUV region by novel electron-electron coincidence magnetic bottle time-of-flight spectrometer in progress at the Free Electron Laser facility, Spring 8, will also be discussed.

References:

- [1] C. M. Tseng, Y. A. Dyakov, C. L. Huang, A. M. Mebel, S. H. Lin, Y. T. Lee, and C. K. Ni, *J. Am. Chem. Soc.* **126**, 8760 (2004).
- [2] C. K. Ni, C. M. Tseng, M. F. Lin, and Y. A. Dyakov, *J. Phys. Chem. B.* **111**, 12631 (2007) (Feature article).
- [3] D. Townsend, S. A. Lahankar, S. K. Lee, S. D. Chambreau, A. G. Suits, X. Zhang, J. Rheinecker, L. B. Harding, and J. M. Bowman, *Science*, **306**, 1158 (2004).

Formalités d'entrée : accès libre dans l'amphi du Pavillon d'Accueil. Si la manifestation a lieu dans le Grand Amphi Soleil du Bâtiment Central, merci de vous munir d'une pièce d'identité (à échanger à l'accueil contre un badge d'accès).

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