

Ultrafast attosecond experiments in molecules, state-of-the-art and perspectives

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Attosecond science has provided new means to investigate molecular processes on ultrafast timescales. Since the first pump-probe experiments performed in molecules¹, new technics have been developed to address new questions² and investigate increasingly complex systems such as polyatomics³ or amino acids⁴. Nowadays, it became possible to perform time-resolved experiments using ultrashort XUV/X-ray pulses combined with transient absorption, angularly resolved photoelectrons spectroscopy, coincidence, mass-spectrometry etc... with these tools, processes such as hole migration, ICD, non-adiabatic dynamics, ionization delays, fragmentation, structural changes can be observed with unprecedented precision. With the improvement of light sources and spectroscopic methods, experiments addressing the dynamics of quantum properties in few-body systems can be probed, at the same time systems of chemical and biological interest such as a protein can be investigated^{5,6}, offering new perspectives in terms of interdisciplinary, which is at the heart of the ATTOCHEM cost action. In this presentation we will describe the fast evolution of the experiment approaches in attosecond molecular science and focus on seminal examples.

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