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CFEL – Building 99, seminar rooms I+II (ground floor)

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Vibronic Interactions Exposed by Chiral Photoionization

The photoionization of chiral species by circularly polarized light produces an asymmetric angular distribution of photoelectrons. The forward-backward asymmetries are typically 1–30%, perhaps three orders of magnitude greater than in other chiroptical phenomena. This offers the sensitivity to probe, in dilute environments, static and dynamic aspects of molecular chirality per se, eliminating the common liquid phase interference from induced chiral structure in a solvation shell. Photoelectron Circular Dichroism (PECD) studies, initially conducted with synchrotron radiation in single photon VUV and SXR regimes, provide the opportunity to examine this phenomenon and have recently been extended to use ultrafast laser excitation sources. These developments open new possibilities for convenient and detailed experiments, including time-resolved studies.

A feature of chiral ionization is a much enhanced sensitivity to scattering phase shifts, and PECD experiments measuring these asymmetries offer fresh generic insights into electron-nuclear interactions. In this talk I will outline some aspects of vibronic interaction in the electron scattering that are revealed by PECD.

Bibliography

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