

MS06-1-4 The icOS laboratory: time-resolved optical spectroscopy on crystals
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Abstract

The *in crystallo* optical spectroscopy (*icOS*) laboratory located at the European Synchrotron Radiation Facility (ESRF) hosts a recently upgraded microspectrophotometer for the measurement of UV/vis absorption, fluorescence emission or Raman spectra from protein crystals, providing complementary information to X-ray crystallography.¹ These experiments can serve to assess the physiological state of the protein *in crystallo*.^{2,3} As these states can be affected by the absorbed X-ray dose, the spectroscopic measurements potentially serve as a metric of the extent of the radiation damage.^{4,5,6} Besides, it can be used to characterize, within crystals, the presence and occupancy of photoreactions intermediate states either at room temperature,^{5,7} with a temporal resolution up to the millisecond, or, quenched at cryogenic temperature.^{5,6,7,8} Recently, we developed a time-resolved *icOS* setup (TR-*icOS*) for the measurement of transient UV-Vis absorption spectra on the microsecond to millisecond time scale. The setup is based on a pump-probe approach with a tunable nanosecond laser as the pump and a xenon flash lamp as the probe. The TR-*icOS* setup will be used to characterize various biological systems that will be studied by time-resolved diffraction on the brand new serial crystallography beamline ID29-SMX (<https://www.esrf.fr/id29>).

References

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