

Time-resolved instrumentation

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Synchrotron-based experiments in which time is an explicit variable fall into two classes: those that exploit the time structure of the x-rays emitted by the storage ring, and those that do not. Experiments in the first class may be further subdivided into those that are single-shot (either because the signal obtained from a single pulse of x-rays is sufficient or because the sample is destroyed), or integrated over many pulses by simple addition of the signal or stroboscopic. Many experiments have been successfully conducted in the second class, but relatively few in the first class. This talk will concentrate on experiments in the first class and consider the x-ray source, the optics, the shutter system to isolate the x-ray pulses, the detector, systems to stimulate the sample, and general aspects of data analysis. The chief illustration will be provided by ns time-resolved macromolecular crystallography experiments (1) conducted at the ESRF, on the photolysis of the carbon monoxide complex of the small heme protein, myoglobin. The results themselves will be presented elsewhere in this meeting by one of our collaborators from ESRF, Thomas Ursby.

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1. Bourgeois, D., et al., *J. Synch. Rad.* 3: 65 -74 (1996).