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New opportunities for time-resolved serial crystallography at the new ID29 from the ESRF extremely brilliant source

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Fourth generation synchrotron sources create new opportunities for expanding the research in structural biology and in protein crystallography in particular. The ESRF Extremely Brilliant Source upgrade programme was completed with the construction of the new ID29, the first world beamline completely dedicated to room temperature experiment and time-resolved macromolecular serial crystallography. The beamline characteristics were designed in order to obtain diffraction data from micrometer sized crystals and achieve a microsecond time resolution. This needed the development of a new class of instrumentation which included a new double chopper timing system, that is able to produce X-ray pulses of 10 microseconds, a new diffractometer, the MD3upSSX, that presents a flexible sample environment, that accommodate fixed target, viscous injectors, microfluidics or tape drive. The experimental setup is completed with a Jungfrau 4M detector that has been integrated in the ESRF data acquisition pipeline and can be operated up to 1 kHz data acquisition rate. In this presentation we will report from the first ground-breaking experiments that took place in this initial year of operation of ID29, along with the beamline development roadmap and future plans.

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Modern Methods in Structural Biology and Dynamics

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Strategy of Large Facilities

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