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XRD2: MX beamline at Elettra - A mix recipe

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For the past 5 years, Elettra has offered an MX beamline on its menu. Even though Italian and Indian users are its main patrons, clients from a wide variety of locations are enjoying all it has to offer. We will describe how we blend flavors of software from different facilities with our in-house ingredients to satisfy the utmost efficiency for mainly take-out orders.

More than a decade of experience at other beamlines around the world helped shape the hardware development to address the needs of our scientific community. XRD2 is no exception with a highly automated environment to allow high throughput and streamlined data analysis pipelines. From its inception, XRD2 needed to provide reliable remote access which steered most of our decisions.

Elettra participates in the MXCuBE[1,2] collaboration initiated at the ESRF. Despite being almost 2 decades old, the vibrant community is still going strong and reaches out to facilities all around the globe. The web version is suited for our Indian partners and has proven to be more performant than remote desktop sharing. MXCuBE is compatible with Elettra's Tango Control System for which a large community provides constant new hardware support and new methods are being folded in.

To pair with data collection, we opted for SynchWeb[3] from Diamond Light Source with its flavor of ISPyB[4] to answer most of the needs involved in sessions at the beamline. Its straightforward interface with our Users' portal, VUO (Virtual Unified Office) enables us to associate scheduling with the relevant people for beamline and data access.

Other aspects such as visualization of the diffraction pattern, data download, live communication with users, and shipping of the dewars rely on in-house solutions. Our facility also provides highly flexible access time, with monthly proposal submission, visits split over several sessions or shifted to match with dewar delivery. This overall blend of technology and flexibility from the facility provides a familiar environment to the users, and manageable support from the staff which has been our recipe for success.

1 Oscarsson, M. et al. 2019. "MXCuBE2: The Dawn of MXCuBE Collaboration." *Journal of Synchrotron Radiation* 26 (Pt 2): 393-405.

2 Gabadinho, J. et al. (2010). MxCuBE: a synchrotron beamline control environment customized for macromolecular crystallography experiments. *J. Synchrotron Rad.* 17, 700-707

3 SynchWeb: a modern interface for ISPyB S. Fisher et al., *J. Appl. Cryst.* (2015). 48, 927-932

4 SPyB: an information management system for synchrotron macromolecular crystallography S. Delageniere et al., *Bioinformatics* (2011) 27 (22): 3186-3192

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