

THE ESRF UPGRADE PROGRAMME: NEW CHALLENGES FOR INSTRUMENTATION

Jean Susini

*Instrumentation Services and Development Division, European Synchrotron Radiation Facility
Grenoble, France*

Instrumentation and the associated enabling technologies underpin every aspect of scientific activity at the ESRF, as in any other large-scale Research Infrastructure. In the early stages of the Upgrade Programme, already well underway, it was recognised that the overall performance of future synchrotron beamlines depends critically on innovative and successful X-ray instrumentation R&D programmes. Furthermore, ensuring optimum designs for beamlines, with full exploitation of the opportunities offered by the enhanced source characteristics and the new experimental hall layout, implies taking an integral approach to the beamline specification, design and implementation. A new multidisciplinary strategy is needed when striving to achieve these goals.

Similarly, it soon became apparent that our organisational structure needed to evolve in order to face the many challenges inherent to our beamline modernisation objectives. This led to the creation of the Instrumentation Services and Development Division in 2009, bringing together all in-house instrumentation resources to create new synergies between the various engineering areas implicated in tackling new, multidisciplinary projects of integrated instrumentation. Driven by the first Upgrade beamline projects, several key technological areas have been identified, such as X-ray mirror engineering, diamond technologies, nanofocusing optics, online data analysis or high-rate data collection.

A fully comprehensive view of all aspects of instrumentation within the ESRF Upgrade is far beyond the scope of this presentation, instead it shall focus on the need for a more multidisciplinary approach, illustrated by a few examples of developments triggered by the new beamline projects.