Poster

Hard X-ray Diffraction Beamlines at Elettra for Material Science : The Present and the Future

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Since 1994, the Elettra hard X-ray diffraction beamlines dedicated to material science are supporting a large community of users coming from different scientific and technological sectors. These beamlines are playing a pivotal role in the scientific production of the facility providing our users valuable information on crystal structure and molecular arrangements and their response to changing environmental and thermodynamic conditions.

The present hard X-ray diffraction beamlines will be presented in terms of characteristics, capabilities and highlights, together with the opportunities the machine upgrade project (Elettra 2.0) will bring to each of them. In particular, the general-purpose X-ray diffraction beamline (XRD1), today hosting mainly measurements for molecular structural solution via single crystal diffraction and material characterization in grazing incidence and variable conditions will significantly decrease the spot size and increase the detector area, introducing a new mounting robot. The MCX beamline, dedicated to powder diffraction will exploit the superconducting wiggle as source, expanding its spectrum up to 36 keV and increasing notably its flux. Moreover, a brand-new experimental set-up based on a 120º Mythen detector and mounting robot will be introduced. The Xpress beamline, currently invoking substantial interest from user community dedicated to the high-pressure powder and single-crystal diffraction, is expected to benefit from a new source, allowing to expand its spectrum with high-resolution and decrease in spot-size, thus boosting the current activities on exploring the matter under higher pressures (up to megabar range) together with variable temperatures from few to several hundreds of Kelvins.

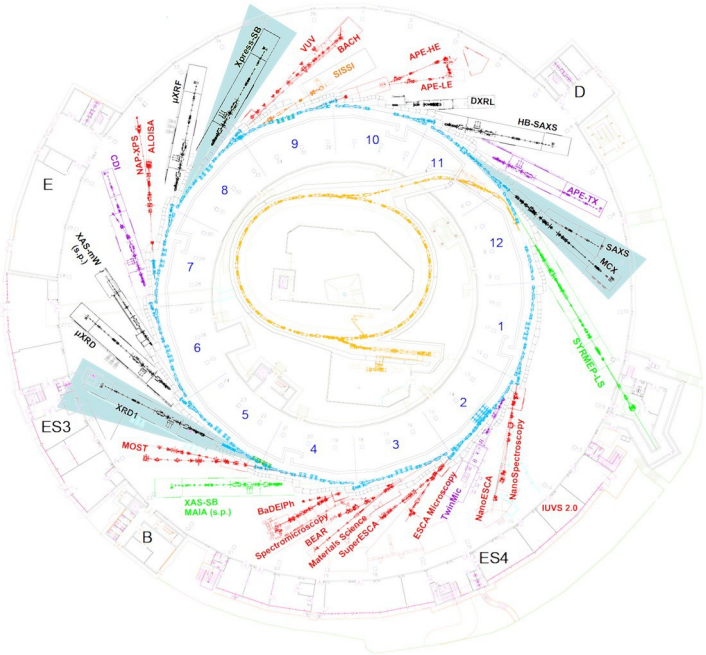

Figure 1. Elettra 2.0 beamlines plan