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The XRF beamline at Elettra: current state

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The X-Ray Fluorescence beamline, developed by Elettra Sincrotrone Trieste and operated in partnership with the International Atomic Energy Agency (IAEA), has a high-versatity optical design. Depending on the experimental needs, one can choose between an X-ray beam having high flux or high energy resolution in a broad energy range (2-14 keV) [1].

In the experimental hutch, the beamline hosts a multipurpose X-ray spectrometry endstation [2] which is well suited for any vacuum-compatible samples.

The manipulator and the set of detectors installed in the chamber are routinely exploited to perform XRF, X-ray Absorption Near Edge Spectroscopy (XANES) and X-Ray Reflectivity (XRR).
As far as XRF and XANES are concerned, when the standard geometry (45/45) is not adequate to characterise the samples, other options can be adopted, i.e. grazing incidence, grazing exit, total reflection and - our most recent addition - x-ray standing wave excitation.

The characteristics of this beamline are suitable to a wide variety of fields including, but not limited to: fundamental physics, medicine, biology, cultural heritage, environmental science.

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[1] W. Jark *et al.*, "Optimisation of a compact optical system for the beamtransport at the x-ray fluorescence beamline at Elettra for experiments with small spots", Advances in X-Ray/EUV optics and components IX, **9207**, pp. 100-111 (2014).

[2] A.G. Karydas *et al.*, "An IAEA multi-technique X-ray spectrometry endstation at Elettra Sincrotrone Trieste: benchmarking results and interdisciplinary applications", Journal of Synchrotron Radiation, **25**, pp.189-203 (2018).

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