

Current and future developments in soft x-ray magnetic spectroscopy at the ESRF

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In the past few years, there has been a considerable emphasis on research into magnetic impurities [1], molecular magnets [2,3] and magnetic nanoparticles [4], at the ESRF ID08 soft x-ray beamline. More and more frequently, the samples under study are produced in-situ and characterised with LEED/Auger and in particular, STM [2] before studying using magnetic dichroism techniques with high magnetic fields and low temperatures. Nevertheless, there has also been a strong demand to study interfacial properties [5,6], for example of superconductors, magneto-resistance materials, multiferroics and also dilute magnetic semiconductors or metals [7] where the samples are often prepared ex-situ. Both soft X-ray diffraction (including holography [8]) and absorption techniques have been in demand. There have also been important developments in resonant inelastic x-ray scattering experiments with dispersing low energy magnetic excitations being observed [9].

A few examples of recent work will be given and in the second part of the talk the plans for the future development of ID08, as part of the ESRF upgrade, will be discussed. Here the emphasis is on very high resolution resonant inelastic x-ray scattering and dichroism with high magnetic fields and sophisticated sample environments. Nevertheless, there will be provision for the future development of other techniques and in particular for user instruments.

References

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