

INSTRUMENTATION &



METHODOLOGY

In the last decade, synchrotron radiation has become an indispensable tool for analyzing the nano- and pico-worlds. The increasing brightness of this light source accompanied by its enhanced X-ray optics performance has made it much easier to investigate 'dynamics' in the nano- and pico-world. A number of new instruments and methods challenging faster dynamics have been developed, greatly benefiting numerous research fields.

In this volume, we present three of the many exciting new developments related to 'dynamics'. The first one is a method for determining the elastic constant of material under high pressure using inelastic X-ray scattering. The coupling of elastic motion and X-rays causes a small shift of scattered X-ray energy, the spectrum of which is used to derive the elastic constant. The second one is the development of a 'time-resolved' XMCD-PEEM system to make pump-probe PEEM measurements, which enables time-resolved photoemission and magnetization reversal measurements. On the contrary, the third one is a method for cancelling the effect of dynamics to have a 'lifetime-broadening free' X-ray absorption spectroscopy.

Based on our operations experience, we are certain that these new developments in instrumentation/methodology will soon find wide a variety of applications.

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