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The Dynamics Beamline (D-Line) at SSRF —A New Beamline Combined with SR-IR and ED-XAS Techniques

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Combined with synchrotron radiation infrared spectroscopy (SR-IR) and energy-dispersive X-ray absorption spectroscopy (ED-XAS), Dynamics beamline (D-Line) is the first beamline in the world which have realized the concurrent measurements of ED-XAS and SR-IR at the same sample position in milliseconds time resolved scale. With the combination of two complementary techniques, D-Line is a powerful research platform to investigate the rapid structural changes of atomic, electron and molecular in complicated disorder systems such as physics, chemistry, materials science, extreme condition matters and so on. ED-XAS and SR-IR can also work as two independent techniques in two branch. The ED-XAS branch is also the first energy dispersive XAS beamline in China which uses a tapered undulator light source and can achieve about 2.5×10^{12} phs/s \cdot 300 eV BW@7.2 keV at the sample position. An exchangeable polychromator, working in Bragg reflection configuration or Laue transmission configuration, is used in different energy range in order to meet the requirements for beam size and energy resolution. The focused beam size is about $3.5 \mu\text{m}(\text{H}) \times 21.5 \mu\text{m}(\text{V})$ at Bragg mode, and the X-rays energy range is 5 to 25 keV. By 1D and 2D position sensitive detectors with frame rate up to 400KHz, tens of microseconds time resolution can be realized. Several distinctive techniques, such as concurrent measurement of in situ ED-XAS and IR, time resolved ED-XAS, high pressure ED-XAS, XMCD and pump-probe ED-XAS can be applied for different scientific goals.

Keywords: ED-XAS, SR-IR, Time-Resolved, D-Line, SSRF

I plan to submit also conference proceedings

No

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