

Observation of high-speed magnetic dynamics by time-resolved photoemission electron microscopy

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【Outline of survey】

Photoemission electron microscopy (PEEM) recently becomes one of the most powerful micro-spectroscopy techniques in synchrotron radiation (SR) facilities in the world, which has been applied for element specific imaging, magnetic domain imaging and photoelectron spectroscopy studies from very small area. PEEM has relatively large field of view as compared with scanning-type microscopy, therefore, the real-time observation or time-resolved measurements are possible. In this study, pump & probe technique is applied for the study in magnetic and spin dynamics of materials, namely movement of spin-direction or magnetic domain as a function of time is observed against pulse field such as magnetic, electric and photon. To realize this, we will construct the pump & probe system having coincident laser or magnetic pulse with SR bunches at BL25SU and 17SU beamlines at the SPring-8. At BL25SU using circularly polarized SR, ferromagnetic sample will be mainly studied. At 17SU, antiferromagnetic samples and photo-induced magnetic materials will be studied.

【Expected results】

We try to achieve very high performance microscope with time- and spatial-resolutions. Realizing the visualization of magnetic or spin-dynamics of above materials may provide us very important information and paradigm for magnetic recording techniques and other applications.

【References by the principal researcher】

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【Term of project】 FY2006 - 2010

【Budget allocation】 35,800,000 yen

【Homepage address】

<http://www.spring8.or.jp/en/>