Soft X-ray studies of magnetic materials under high magnetic fields

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An instrument for measuring soft X-ray magnetic circular dichroism (XMCD) under high pulsed magnetic fields up to 40 T has been developed at the soft X-ray beamline BL25SU, SPring-8 [1]. XMCD in the soft X-ray region is especially favorable because of the fact that the spectrum is directly associated with the dominant magnetic carriers of the major magnetic elements, which are the 3*d*- and 4*f*-states of the transition metals and the lanthanoides, respectively. The present technique has been demonstrated in studies of isothermal switching of exchange bias films [2], valence-specific magnetization in the charge-ordered multi-ferroelectric $LuFe_2O_4$ [3], the magnetic field induced valence transition in Eu compounds [4], and element specific magnetization analysis of Nd-Fe-B sintered magnets.

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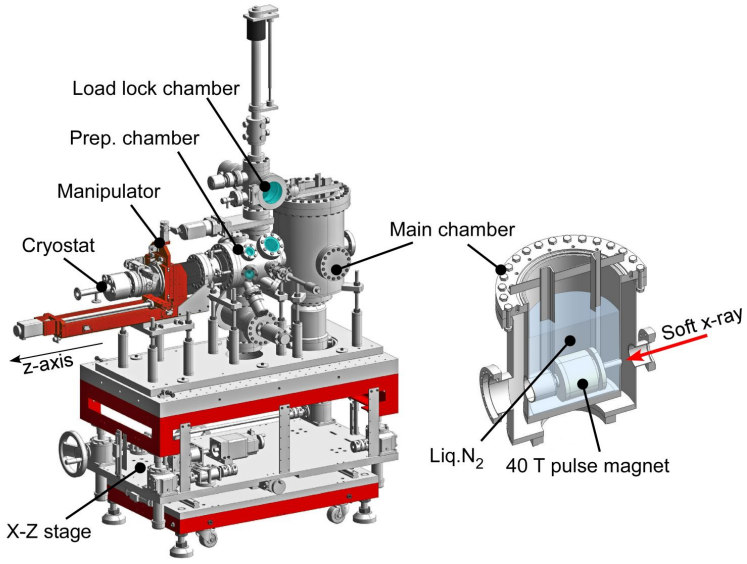

Schematic drawings of the XMCD apparatus equipped with the 40 T pulse magnet.

References

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