ESRF	Experiment title: HIGH PRESSURE INDUCED MAGNETIC PHASE TRANSITIONS IN $PtFe_3$ INVAR STUDIED BY XMCD AT ID24	Experiment number: BE-151
Beamline: BL8-ID24	**Date of experiment:** **from:** 16 April 1997 to: 28 April 1997	**Date of report:** 2.5 August 1997
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Report:

XMCD under high pressure experiments have been attempted on the ID 24 - BL8 at the ESRF. Our original aim was to measure the XMCD signal at the Fe K edge of iron, which is not accessible at LURE because of the insufficient x-ray intensity. Part of the experimental procedure was successful, nevertheless it has not been possible to record a reliable XMCD signal under pressure.

The energy dispersive spectrometer was adjusted with focus size of 50 pm, better than required by our high pressure cell. The circular polarisation rate given by the diamond quarter wave plate was excellent, and allowed good XMCD spectra to be measured on pure iron foil outside the high pressure cell.

The high pressure cell and its holder was successfully used at LURE at the Pt L edges (11 - 13 keV). The smaller size of the ESRF beam makes the signal more sensitive to any fluctuations of the sample position or even to the detector position.

Our sample environment was mounted on a vertical translator, whose stability was probably not sufficient for this experiment. There are presently new equipments on ID24 which give very stable and reproducible movements of the sample environment, the detector and to the quarter wave plate. Part of the observed problems should consequently be solved.

There are two other improvements which should increase the success of XMCD under pressure at ESRF. We are building an ESRF dedicated sample holder with a maximum of rigidity and a minimum of degrees of freedom. The degrees of freedom will be provided, as much as possible, by supporting the sample holder by very reliable GMI mechanical movement available on ID24.

In order to overcome problems associated with the fluctuations of the speckle pattern accmnlulated by the beam path, the experiment will be performed on a very homogeneous sample. While for this session a powdered sample was used, for the next experimental run we plane to prepare by sputtering a thin film of $PtFe_3$.

Hence we'll take fully advantage og the brilliance of ESRF.