

Magnetism of the 4d transition metal in Pd/Fe multilayers by XMCD

Alain Fontaine and J. Vogel

*Laboratoire Louis Neel, Centre National de la Recherche Scientifique, 25 Avenue des Martyrs
BP 166, Cedex 9, 38042 Grenoble, France*

V. Cros and F. Pétroff

U. Mixte CNRS-Thomson CSF, Corbeville, F 91404 Orsay, France

J. P. Kappler

IPCMS, 23 rue de Loess, F Strasbourg, France

G. Krill

LURE, CRS Batiment 209C, F-91405 Orsay, France

A. Rogalev and José Goulon

XAFS Group, European Synchrotron Radiation Facility, BP 220, F38043 Grenoble, France

Measurements of the Pd 4d orbital and spin moments have been performed in Fe/Pd multilayers with different Pd thicknesses using x-ray magnetic circular dichroism (XMCD) at the Pd L_3/L_2 edges. EXAFS of each Pd layer of different thickness is a mere linear combination of the spectrum of the 2 atomic-layer-thick Pd - which is fct - and the bulk Pd signal. Therefore the Pd/Fe interface is almost perfect. The Pd interface atoms are strongly spin polarized with a total moment up to $0.4 \mu_B$ with a Pd orbital moment limited to $0.04 \mu_B$ for the layer adjacent to and in contact with Fe. This result suggests that the in-plane easy axis of magnetization is not caused by the 4d orbital momentum anisotropy. The thickness dependence of the Pd XMCD shows that atoms distant from more than 4 layers are no longer spin polarized. Fresh Fe XMCD results will be available and discussed in the context of the Pd electronic and magnetic data.