ESRF	**Experiment title:** FERMI SURFACE AND ELECTRON-ELECTRON CORRELATION IN CrV ALLOY	**Experiment number:** *HE62*
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Shifts: *24*	**Local contact(s):** Thomas Buslaps ; Abhay Shukla	*Received at ESRF:*

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Report:

The aim of the experiments on CrV alloys (HE-62, Dec 1996, and present proposal for the second semester 1997) is to obtain information about the changes in geometry of the Fermi surface with V concentration.

The experiment has been performed with the scattering angle settled at 160" and the synchrotron radiation has been monochromatized at 55.7882 keV. We have measured 12 directional Compton profiles (DCPs) of Cr and 4 DCPs of Cr-30at%V. In the first step, we have concentrated us on Cr studies.

The data sets have been corrected for energy dependent effects such as photoelectric absorption in sample, analyzer and air (photon path between sample, analyzer and detector) by using a local correction algorithm (P.Fajardo, T. Buslaps, ESRF).

Due to the flatness of core profile in momentum space, it is easy to subtract its contribution, evaluated by QSCF method (collaboration with A. Issolah, Tizi-Ouzou), from the total measured DCP in order to get the valence DCP of interest alone. Experimental valence profiles are normalized to the number of valence electrons per atom for Cr and per unit cell for CrV.

The first step: it is appropriate to obtain Compton anisotropy by making the difference between two directional profiles, as a consequence, many of the systematic errors inherent in both theory and experiment can be removed when one directional profile is subtracted from another. The data are not filtered and the measured profiles no-symetrized.

On figure 1, the experimental anisotropy, between [100] and [110] directions, is reported together with theoretical results (APW calculations performed by S. Wakoh, Y. Kubo and J. Yamashita).

We can notice the nice description of the theoretical structures for large values of |q| (q<-0.5 a. u., the data for q>2 cannot be used because of a "glitch" due to the analyzing crystal).

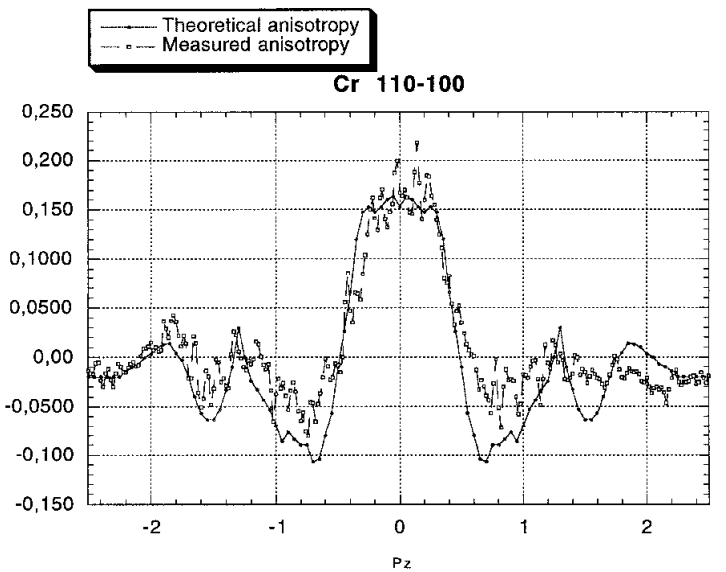

Figure 1

The second step which is the most ambitious is to reconstruct the 2D map of the electronic density in momentum space. Such a reconstruction has to be done with DCPs very accurately corrected from all experimental effects (background substraction, multiple scattering contribution, deviation from impulsion approximation, . ..). The resultant anisotropy is shown in figure 1. Reconstruction is under process by two methods for Cr, Cormack method and direct Fourier transformation method. With 4 profiles measured on Cr-30%atV, only the Cormack method is able to give us some idea of the Fermi surface of the alloy: the Fourier transform method needs more data.

The preliminary results look quite promising.