ESRF	**Experiment title:** Evaluation of the performances of Silicon Drift Chambers as detectors for X-Fluorescence excitation spectroscopy.	**Experiment number:** MI-57
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shifts: 18	**Local contact(s):** Ch. Gauthier	*Received at ESRF:* 01 mars 1996

Names and affiliations of applicants (* indicates experimentalists):

L. Struder, P. Lechner*. *MPI for extraterrestrial Physics (Munich).*
A. Longoni, M. Sampietro, C. Fiorini*. *Istituto di electronics, Politecnico di Milano.*
A. Walenta, H. Besch*, H. Schen.k*, R. Pfitzner*, U. Tafelmeier*.
Universitat Gesamthochschule Siegen
Ch. Gauthier*, J. Goulon*, E. Moguiline*. ESRF.
K. Misiakos, S. Kavadias, *NSCR Democritos (Athens)*
H. Witte, *T.U. Magdeburg.*

Report:

Silicon drift chambers (SDC) feature ultra small readout capacitance's (typ. 200 fF) independent of their active area [1-2]. Moreover, when capacitive matching between the detector and the front end electronics is achieved with on chip integration, excellent energy resolutions can be obtained together with high counting rates [4-3]. For the first time, a monolithic array of 6 SDC's with on chip integrated J.FET's was used to record XAFS spectra.

The J.FET's were configured as Source Followers, followed by a voltage amplification stage. The active area of each channel was 3.5 mm^2 giving a total active area of 21 mm^2. At room temperature, the energy resolution was 227 eV FWHM at the 5.89 keV fluorescence line of Mn (measured with ^{55}Fe source) with a shaping time of 0.5 μs. The resolution improves to 152 eV FWHM at -20 °C and 139 eV at 155 'K for a shaping time of 5 μs. For a very fast shaping time (250 ns), the energy resolution is still 163 eV FWHM at 155 °K. The difference in resolution between each anode is less than 1070.

The detector output signals were fed into six spectroscopy amplifiers (Tennelec TC244) followed by single channels analysers with windows centered on the energy of the fluorescence line. Counting was done using the standard ESRF VME counter/gate generator VCT6.

Spectra have been recorded at the ESRF on BL#6 at **room temperature. XANES** spectra at the K edges of Cl (in $SnC1_2$) and Cr (magnetic tape) have been measured We have studied the LIII (fig. 1) and LII (Fig. 2) absorption edges of Ce in CeTETP. Eventhough, the L_a and Lb fluorescence lines were perfectly discriminated in energy, there was still an interference effect between the LIII and LII edges due to the self absorption of the sample. One can see in Fig. 2, that the La fluorescence line intensity reproduce negatively the LII edge. This effect had already been predicted in ref. [5].

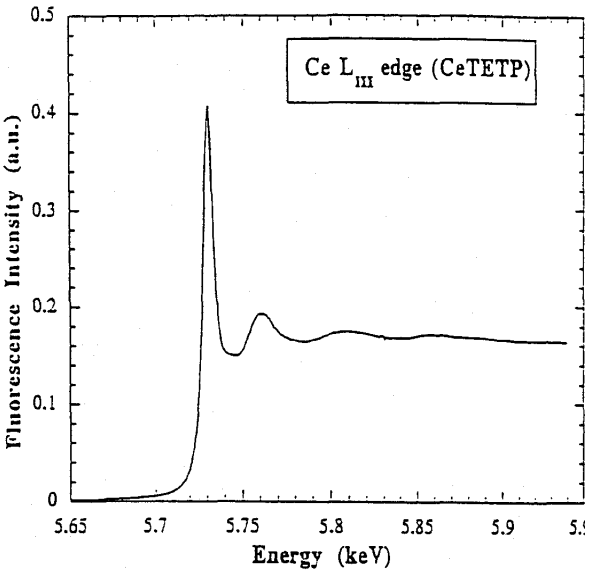

Figure 1.

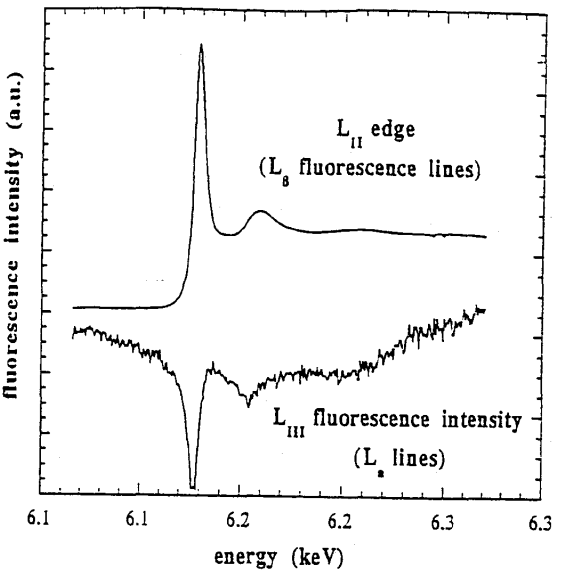

Figure 2.

References

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