

## Experiment Report Form

**The double page inside this form is to be filled in by all users or groups of users who have had access to beam time for measurements at the ESRF.**

Once completed, the report should be submitted electronically to the User Office via the User Portal:

<https://www.esrf.fr/misapps/SMISWebClient/protected/welcome.do>

### ***Reports supporting requests for additional beam time***

Reports can be submitted independently of new proposals – it is necessary simply to indicate the number of the report(s) supporting a new proposal on the proposal form.

The Review Committees reserve the right to reject new proposals from groups who have not reported on the use of beam time allocated previously.

### ***Reports on experiments relating to long term projects***

Proposers awarded beam time for a long term project are required to submit an interim report at the end of each year, irrespective of the number of shifts of beam time they have used.

### ***Published papers***

All users must give proper credit to ESRF staff members and proper mention to ESRF facilities which were essential for the results described in any ensuing publication. Further, they are obliged to send to the Joint ESRF/ ILL library the complete reference and the abstract of all papers appearing in print, and resulting from the use of the ESRF.

Should you wish to make more general comments on the experiment, please note them on the User Evaluation Form, and send both the Report and the Evaluation Form to the User Office.

### **Deadlines for submission of Experimental Reports**

- 1st March for experiments carried out up until June of the previous year;
- 1st September for experiments carried out up until January of the same year.

### **Instructions for preparing your Report**

- ◆ fill in a separate form for each project or series of measurements.
- ◆ type your report, in English.
- ◆ include the reference number of the proposal to which the report refers.
- ◆ make sure that the text, tables and figures fit into the space available.
- ◆ if your work is published or is in press, you may prefer to paste in the abstract, and add full reference details. If the abstract is in a language other than English, please include an English translation.



	<b>Experiment title:</b> Study of the local environment in Phase Change Materials thin films in relation with the resistance drift phenomenon in PCRAM devices	<b>Experiment number:</b>
<b>Beamline:</b> BM08	<b>Date of experiment:</b> from: 25-9-13 to: 1-10-13	<b>Date of report:</b> 23-10-13
<b>Shifts:</b> 18	<b>Local contact(s):</b> F. d'Acapito	<i>Received at ESRF:</i>
<b>Names and affiliations of applicants</b> (* indicates experimentalists): Francesco DACAPITO CNR-IOM-OGG (*) Chiara SABBIONE CEA- Grenoble (*) Veronique SOUSA CEA- Grenoble (*) Frédéric FILLOT CEA- Grenoble (*) Pierre NOE CEA- Grenoble (*)		

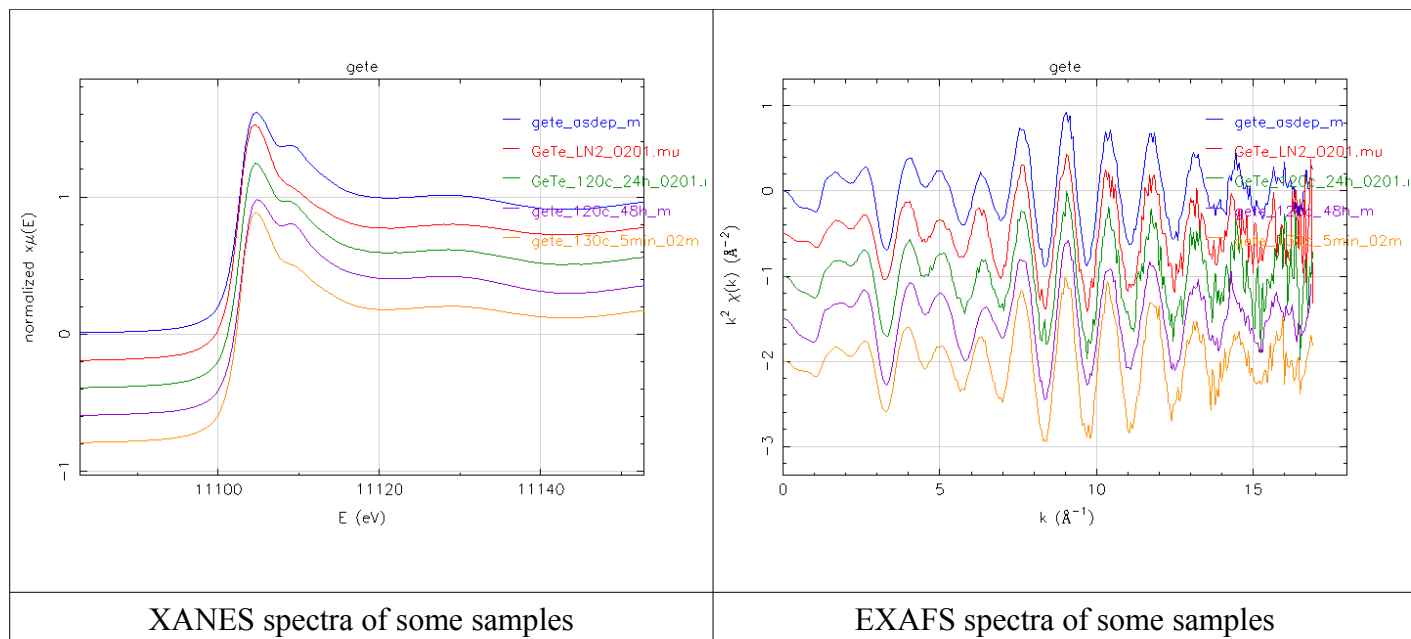
## Report:

Thin layers (500nm) of GeTe alloy samples have been investigated at the Ge-K edge in fluorescence mode. The machine was in uniform mode so it has been possible to profit of the high flux mode of the storage ring. The samples were mounted on the GIXAS setup in order to make the data collection at low incidence angle (2 deg) and low temperature (100K). A considerable variety of differently treated specimens was investigated, in particular:

- ◆ GeTe as-deposited and drifted at 120 °C and 130 °C
- ◆ GeTeC alloys (C at 4%) as-dep and drifted at 130 °C, 150 °C and 200 °C.
- ◆ GeTeN alloys (N at 5%) as-dep and drifted at 130 °C and 200 °C.
- ◆ GeTeN alloys (N at 10%) as-dep and drifted at 130 °C and 200 °C.
- ◆ GeSbTe alloys (Ge at 45%) as-dep and drifted at 130 °C and 200 °C.
- ◆ Fully crystallized specimens of each sample.

Data are of good quality and will permit a complete quantitative data analysis. With this investigation we have been collected data to fully describe the changing of the Ge environment in samples presenting low (GeTeC), medium (GeTe) and high (GeTeN, GST) drift. This should in principle permit to understand the relation between structure and drift. Some differences between the spectra could be detected by a qualitative analysis and the

quantitative data analysis is currently in progress. Examples of data (GeTe series) are shown in the pictures below:



The Te-K edge was not collected due to time limitations and will be the object of a forthcoming proposal.

