

## 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 using the **Electronic Report Submission Application:**

*<http://193.49.43.2:8080/smis/servlet/UserUtils?start>*

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

Reports can now 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> <b>Mechanical relaxation of hair</b>	<b>Experiment number:</b> LS-1988
<b>Beamline:</b> ID13	<b>Date of experiment:</b> from: nov. 16 <sup>th</sup> 2001 to: nov. 19 <sup>th</sup> 2001	<b>Date of report:</b> March 4 <sup>th</sup> 2002
<b>Shifts:</b> 9	<b>Local contact(s):</b> M. David FLOT	<i>Received at ESRF:</i>
<b>Names and affiliations of applicants (* indicates experimentalists):</b> <b>J. Doucet, L. Kreplak, C. Merigoux, Ph. Barbarat</b>		

### Report:

**X-ray diffraction experiments were carried out to study hair relaxation process under mechanical stress.**

**The mechanical tests were performed using a micro-tensile device developed by J. Doucet and L. Kreplak. The evolution of the keratin structure was observed in microdiffraction with a 5 $\mu$ m-diameter beam and recorded through a MAR CCD camera.**

**Caucasian hairs were studied in various relative humidity conditions, 45% relative humidity and water-immersed samples, respectively. The keratin structure evolution was monitored at 2%, 5%, 15% and 30% strain as a function of time.**

**The following results were obtained :**

- **no relaxation occur as long as a mechanical stress is applied to the fibre,**
- **the duration of the recovery process highly depends on the strain amplitude, ranging from minutes for small strains to hours for high strains of the fibre,**
- **water was found to reduce the duration of the recovery process.**