



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.



	Experiment title: Influence of disorder on the electronic properties of Yb-Ni compounds	Experiment number: 25-01 700
Beamline: BM25A	Date of experiment: from: 9 June 2009 to: 12 June 2009	Date of report: 10/09/2010
Shifts: 9	Local contact(s): Dr. Jon Ander Gallastegui	<i>Received at ESRF:</i>
Names and affiliations of applicants (* indicates experimentalists): * Dr. Daniel Rojas Pupo Dr. Luis Fernández Barquin Dr. Jesus Chaboy Nalda * Dr. Jose I. Espeso Dr. Jesus Rodríguez Fernández * Diego Alba Venero		

Report:

Yb (LII, LIII-edge) and K-Ni edge X-ray absorption measurements have been carried out in the series of bulk and milled Yb-Ni and Yb₂O₃ samples. The measurements were extended to photon energies above the absorption edge, in the EXAFS region. The results for the YbNi₂ series are displayed in Fig. 1. The mean valence of Yb ion was determined by the standard procedure which considers a linear function to account for the background, two Lorentzians representing trivalent absorption with a white line at 8945 eV, and the other corresponding to divalent absorption at 8937 eV, and two modified inverse tangent functions of the absorption edges. Different to the YbAl₃ series, the results for the YbNi₂ series show that the valence does not change, even for 30 hours milled sample, with a mean grain size of 12 nm, as shown in Fig.1. On the other hand, the results for the Yb₂O₃ series of milled alloys are shown in Fig.2. They show that the milling process induces variations in the electronic state of this material, when the grain size reduces down to 21 nm.

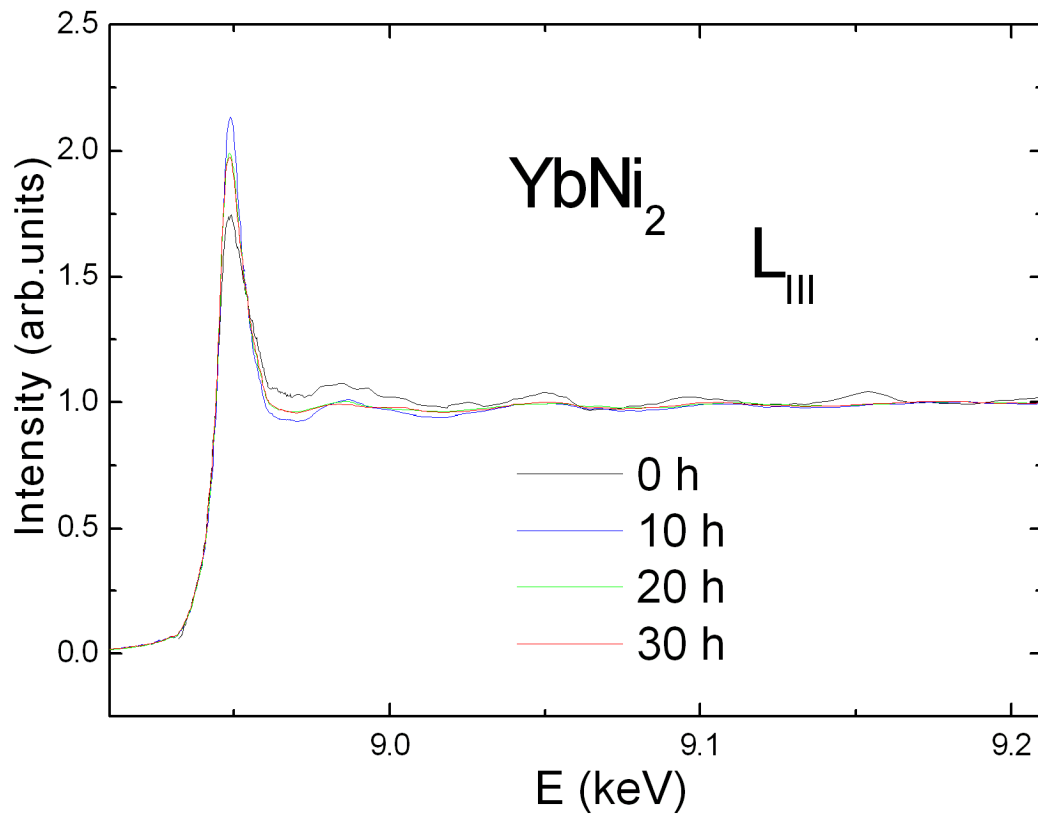


Fig. 1- Results of X-ray absorption at LIII edge measurements for the series of YbNi_2 milled alloys. Details around the absorption edge are shown in the inset.

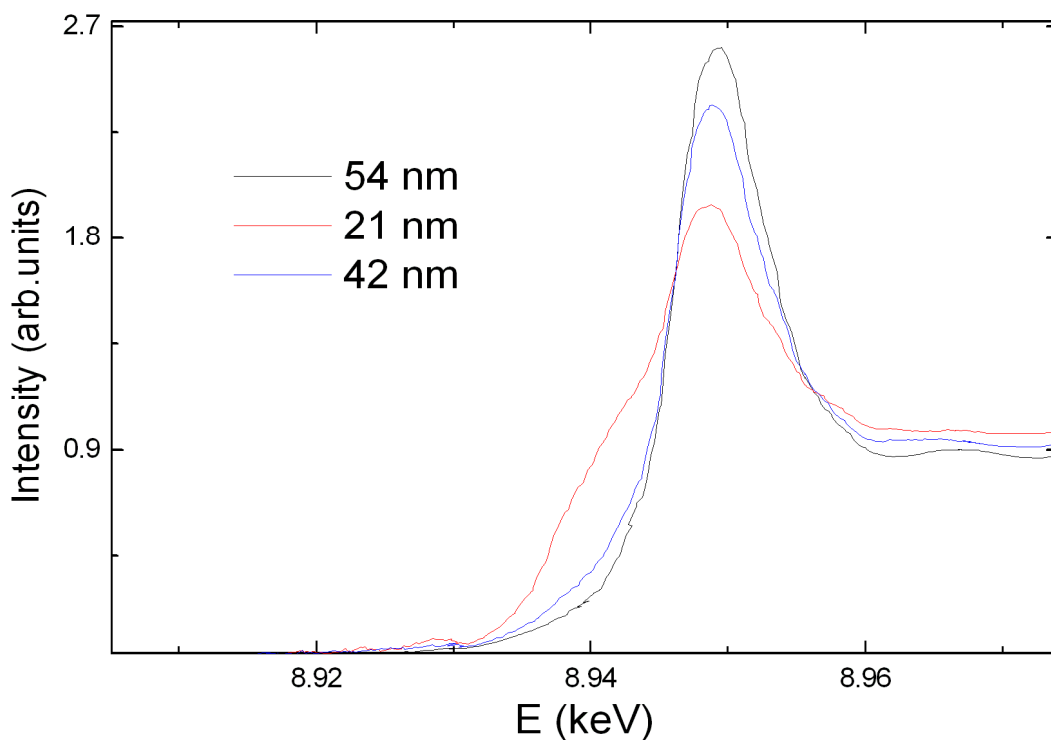


Fig. 2- Results of X-ray absorption at LIII edge measurements for the series of bulk and milled Yb_2O_3 . A change in the Yb^{2+} contribution is clearly observed, marked with an arrow, and shown in the inset. The reference Yb_2O_3 has been used for comparison purposes.