EUROPEAN SYNCHROTRON RADIATION FACILITY

INSTALLATION EUROPEENNE DE RAYONNEMENT SYNCHROTRON

ESRF

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://wwws.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.

ESRF	**Experiment title: Probing buried Fe/Si interfaces in Si/Fe/Si trilayers.**	**Experiment number**: SI-2268
Beamline: BM25	**Date of experiment**: from: 29/06/2011 to: 05/07/2011	**Date of report**: 17/09/2014
Shifts: 18	**Local contact(s)**: Germán Rafael Castro and Juan Rubio Zuazo	*Received at ESRF:*

Names and affiliations of applicants (* indicates experimentalists):

Juan Bartolomé Sanjoaquin*, Laura Badía Romano, Javier Rubín Llera and Fernando Bartolomé Usieto, Universidad de Zaragoza – CSIC Facultad de Ciencias, Instituto de Ciencia de Materiales de Aragón, Zaragoza, Spain

Report: The experiment mentioned above was performed at the BM25 beamline, branch B, from 29/06/2011 to 05/07/2011. As result of our work in SpLine, we have published the results on the SPIN journal, Reference:

SPIN Vol. 4, No. 1 (2014) 1440002 (7 pages)

DOI: 10.1142/S2010324714400025

Title: "Morphological and compositional study at the Si/Fe interface of (Fe/Si) multilayer".
Authors: L. BADÍA-ROMANO, J. RUBÍN, F. BARTOLOMÉ, J. BARTOLOMÉ, S. OVCHINNIKOV, S. VARNAKOV, C. MAGÉN, J. RUBIO-ZUAZO and G. R. CASTRO.
Abstract:
Diffusion and reaction of elements at the interfaces of nanostructured systems play an important role in controlling their physical and chemical properties for subsequent applications. (Fe/Si) nanolayers were prepared by thermal evaporation under ultrahigh vacuum onto a Si(100) substrate. A morphological characterization of these films was performed by combination of scanning transmission electron microscopy (STEM) and X-ray reflectivity (XRR). The compositional depth profile of the (Fe/Si) structures was obtained by angle resolved X-ray photoelectron spectroscopy (ARXPS) and hard X-ray photoelectron spectroscopy (HAXPES). Moreover, determination of the stable phases formed at the Si on Fe interfaces was performed using conversion electron Mössbauer spectroscopy. The Si/Fe interface thickness and roughness were determined to be 1.4 nm and 0.6 nm, respectively. A large fraction of the interface is composed of c-Fe_{1-x} Si paramagnetic phase, though a minoritary ferromagnetic Fe rich silicide phase is also present.