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:** Lattice location study of diluted implanted Co in Ge, ZnO and GaN	**Experiment number**: 26-01- 930
Beamline: BM26A	**Date of experiment**: from: 28 September 2011 to: 02 October 2011	**Date of report**: 23 Aug. 2014
Shifts: 12	**Local contact(s)**: Sergey Nikitenko	*Received at ESRF:*

Names and affiliations of applicants (* indicates experimentalists):

Dr. Stefan Decoster (KU Leuven)
Prof. dr. Margriet Van bael (KU Leuven)
*Dr. Lino miguel da Costa Pereira (KU Leuven)
Dr. Enric Menendez Dalmau (KU Leuven)
Prof. dr. Kristiaan Temst (KU Leuven)
*Dr. Claudia Fleischmann (KU Leuven)
Prof. André Vantomme (KU Leuven)
Dr. Sebastien Couet (KU Leuven)
* D.Y. Li (KU Leuven) - experimentalist, not applicant
* Y.J. Zeng (KU Leuven) - experimentalist, not applicant

Report:

Part of the outcome of these experiments was published in (other manuscripts in preparation):

ACS Appl. Mater. Interfaces **6**, 4737 (2014)
Li D.Y., Zeng Y.J., Batuk D., Pereira L.M.C., Ye Z.Z., Fleischmann C., Menghini M., Nikitenko S., Hadermann J., Temst K., Vantomme A., Van Bael M.J., Locquet J.P., Van Haesendonck C.
Impact factor (2014): 5.9

Abstract:

ZnO-Co nanocomposite thin films are synthesized by combination of pulsed laser deposition of ZnO and Co ion implantation. Both superparamagnetism and relaxor ferroelectricity as well as magnetoelectric coupling in the nanocomposites have been demonstrated. The unexpected relaxor ferroelectricity is believed to be the result of the local lattice distortion induced by the incorporation of the Co nanoparticles. Magnetoelectric coupling can be attributed to the interaction between the electric dipole moments and the magnetic moments, which are both induced by the incorporation of Co. The introduced ZnO-Co nanocomposite thin films are different from conventional strain-mediated multiferroic composites.