



Contribution ID: 43

Type: **Submitted oral (online)**

A study of the local fields in bismuth ferrite by using different radioactive tracer ions

Friday 1 December 2023 10:00 (12 minutes)

This work presents the study of the local electric and magnetic fields in multiferroic bismuth ferrite (BiFeO_3 : BFO) using Time Differential Perturbed Angular Correlation (TDPAC) spectroscopy. The measurements were carried out at a wide range of temperatures up to 850°C, after the implantation of various radioactive tracer ions: ^{181}Hf , ^{111}In and ^{111m}Cd . The experimental results reflect the obedience to the Landau theory and the Brillouin-Weiss equation of local electric polarization and magnetization, respectively. Particularly, a huge coupling between local electric and magnetic fields has been investigated in anti-ferromagnetic order. With the support of ab-initio DFT simulations, we are able to discuss the site-assignment for the probe nucleus, and conclude that under our experimental conditions, the ^{111m}Cd is located at the Bi-atom at the A-site, ^{181}Hf and ^{111}In probes substitute the Fe-atom at the B-site.

Author: DANG, Thanh Thien (Institut Fur Materialwissenschaft Universität Duisburg-Essen (DE))

Co-authors: Dr MOKHLES GERAMI, Adeleh (School of Particles and Accelerators, Institute for Research in Fundamental Sciences (IPM), P.O. Box 19395-5531, Tehran, Iran); Ms GONZÁLEZ BOA, Andrea (Technical University of Denmark (DTU), 2800 Kongens Lyngby, Denmark); Dr DUBEY, Astita (Institute for Materials Science and Center for Nanointegration Duisburg-Essen (CENIDE), University of Duisburg-Essen, 45141 Essen, Germany); Ms NOLL, Cornelia (Helmholtz-Institut für Strahlen- und Kernphysik, University of Bonn, 53115 Bonn, Germany); Mr LEWIN, Daniil (Institute for Materials Science and Center for Nanointegration Duisburg-Essen (CENIDE), University of Duisburg-Essen, 45141 Essen, Germany); Dr ZYABKIN, Dmitry (Chair Materials for Electronics, Institute of Materials Science and Engineering, and Institute of Micro and Nanotechnologies MacroNano®, TU Ilmenau, 98693 Ilmenau, Germany); Prof. CONSTANTIN LUPASCU, Doru (Institute for Materials Science and Center for Nanointegration Duisburg-Essen (CENIDE), University of Duisburg-Essen, 45141 Essen, Germany); Dr MARSCHICK, Georg (Institute for Solid State Electronics and Center for Micro- and Nanostructures, Vienna University of Technology, Vienna 1040, Austria); Mr CHANG JIE YAP, Ian (Institute for Materials Science and Center for Nanointegration Duisburg-Essen (CENIDE), University of Duisburg-Essen, 45141 Essen, Germany); Dr NUNO GONÇALVES, João (CICECO - Aveiro Institute of Materials and Departamento de Física, Universidade de Aveiro, 3810-193 Aveiro, Portugal); Dr SCHELL, Juliana (Institute for Materials Science and Center for Nanointegration Duisburg-Essen (CENIDE), University of Duisburg-Essen, 45141 Essen, Germany; European Organization for Nuclear Research (CERN), 1211 Geneva, Switzerland); Dr VAN STIPHOUT, Koen (Georg-August-Universität Göttingen, Friedrich-Hund-Platz 1, 37077 Göttingen, Germany); Dr GLUKHOV, Konstantin (Uzhhorod National University, 88000 Uzhhorod, Ukraine); Dr ESCOBAR-CASTILLO, Marianela (Institute for Materials Science and Center for Nanointegration Duisburg-Essen (CENIDE), University of Duisburg-Essen, 45141 Essen, Germany); Prof. BECK, Reinhard (Helmholtz-Institut für Strahlen- und Kernphysik, University of Bonn, 53115 Bonn, Germany)

Presenter: DANG, Thanh Thien (Institut Fur Materialwissenschaft Universität Duisburg-Essen (DE))

Session Classification: Solid State Physics