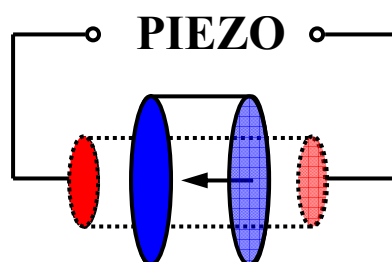


Technical University of Liberec
International Center for Piezoelectric Research

Piezoelectricity Research Laboratory



ACTIVITY REPORT
1999-2002

Contact:

Doc.Mgr.J.Erhart, Ph.D.,

Department of Physics, Technical University of Liberec, Studentská 2, CZ-461 17

Liberec 1, Czech Republic

phone: +420-485353400, E-mail: jiri.erhart@tul.cz

Introduction

During this period experimental work has been performed in the laboratories (Piezoelectric laboratory and Optics laboratory) of the Department of Physics, which existed formerly since 1996. During 2002 year, donation of experimental equipment from prof.Karel Hruška, York University of Toronto, Canada has been realized and delivered to Liberec. Equipment has been stored in the office of J.Erhart. Some new equipment has been purchased from the ongoing grant projects. International Center for Piezoelectric Research (ICPR) has been founded by Prof.J.Fousek, Prof.J.Nosek and J.Erhart as a common activity with colleagues from the Faculty of Mechatronics and Interdisciplinary Engineering Studies at the end of 1999 year.

Field of research

Mainly ferroelectric domains and domain engineering in ferroelectric materials. Minor attention has been paid to electromechanical properties of PZT ceramics, poling parameters and its applications (testing of parameters for ceramics bimorphs, unimorphs).

Academic staff

Jiří Erhart

Students

Petr Půlpán, Ondřej Hedánek, Vít Lédl, Luboš Rusin, Lukáš Seifert – all from Faculty of Mechatronics and Interdisciplinary Engineering Studies, TUL

Grant projects

J.Erhart: Domain engineering in ferroelectric materials
Grant Agency of the Czech Republic, GAČR 202/02/1006, 2002-2004

J.Erhart: Thematic Network Polar Electroceramics (POLECER), 5th Framework program EU (grant No. G5RT-CT-2001-05024), 2002-2007

Participation on other projects

J.Fousek: Crystals Physics
CRYSTAL ASSOCIATES, Inc., USA, DARPA project subcontract No.6518, 2000-2001

A.Kopal: Ferroelectric composites
Grant Agency of the Czech Republic, GAČR 202/00/1245, 2000-2002

J.Nosek: Microelectromechanical Systems
Ministry of Education, MSM 242200002, 1999-2004

Dissertations, Diploma, Bachelor and Project Thesis

Dissertations

J.Erhart: Domain engineering in ferroelectric materials, TU Liberec 2001

Diploma Theses (in Czech)

P.Půlpán: Studium parametrů piezoelektrických prvků, TU Liberec 2002 (Cena rektora)

Project Theses (in Czech)

P.Půlpán: Studium parametrů piezoelektrických prvků, TU Liberec 2001

V.Lédl: Měření materiálových vlastností piezoelektrické PZT keramiky v závislosti na způsobu polarizace, TU Liberec 2002

O.Hedánek: Měření materiálových vlastností piezoelektrické PZT keramiky v závislosti na způsobu polarizace, TU Liberec 2002

Conferences, seminars, presentations (in Czech)

Co-organization (with ICPR colleagues) of Czech seminar

„Mikroelektromechanické systémy“, TU Liberec, June 2000, 35 participants

Organization of Czech seminar

„Piezoelektrické vlastnosti látek a jejich měření“, June 2002, 35 participants

Publications

J.Erhart, W.Cao: Effective Material Properties in Twinned Ferroelectric Crystals
J.Appl.Phys. **86**, 2 (1999) 1073-1081

J.Erhart, W.Cao: Effective Symmetry and Physical Properties of Twinned Perovskite
Ferroelectric Single Crystals
J.Mater.Research **16**, 2 (2001) 570-578

J.Erhart, W.Cao, J.Fousek: The Structure of S-walls in $m\bar{3}m \rightarrow mmm$ Ferroelastics
Ferroelectrics **252** (2001) 137-144

J.Erhart, L.Burianová: What is really measured on d_{33} -meter?
J.European Ceram.Society **21** (2001) 1413-1415

M.Abplanalp, D.Barošová, P.Bridenbaugh, J.Erhart, J.Fousek, P.Günter, J.Nosek, M.Šulc:
Ferroelectric Domain Structures in PZN-8%PT Single Crystals Studied by Scanning Force
Microscopy
Solid State Communications **119** (2001) 7-12

J.Erhart, S.Panoš: Piezoelectric Composite „Shear-moonie“ Transducer
Ann. Chim.Sci. Mat. **26** (2001) 173-176

M.Abplanalp, D.Barošová, P.Bridenbaugh, J.Erhart, J.Fousek, P.Günter, J.Nosek, M.Šulc:
Domain structures in PZN-8%PT and PMN-29%PT single crystals studied by scanning force
microscopy
J.Appl.Phys. **91** (2002) 3797-3805

In Czech

J.Erhart: Měření na ručkových elektrických přístrojích
Školská fyzika **2**/2000, str.12-16

P.Půlpán, J.Erhart: Parametry piezoelektrických bimorfů
Elektro **3** (2002) 4-7

J.Erhart: Piezoelektrické “chytré” materiály pro elektrotechniku, PZT keramika
Elektro **11** (2002) 4-7