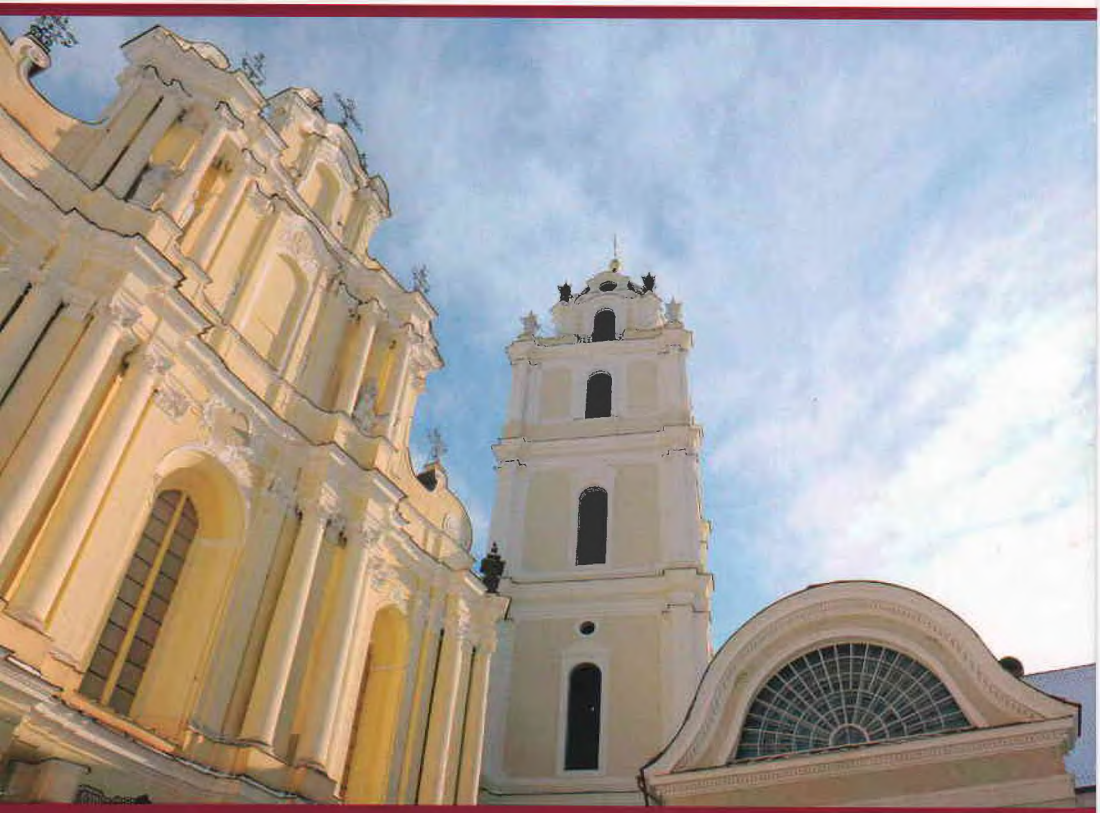
SEMINAR

NEW MULTIFEROICS AND SUPERIONIC CONDUCTORS FOR ACUSTOELECTRONICS AND SOLID STATE IONICS

PROGRAM AND BOOK OF ABSTRACTS



10 OCTOBER 2017

VILNIUS / LITHUANIA

PROGRAM

(NFTMC, Saulėtekio av. 3)

10:00–10:10 Opening remarks (prof. J. Banys)

10:10–10:30 R. Yevych, M. Medulych, I. Zamaraite, A. Dziaugys, J. Banys, **Yulian Vysochanskii**

Nonlinear dynamics of phosphorous chalcogenide ferroelectrics with many-well local potentials

10:30–10:50 **Andrius Džiaugys**, M. Chyasnavichyus, A. Belianinov, Q. He, A. Borisevich, A. N. Morozovska, E. A. Eliseev, J. Banys, Y. Vysochanskii, S.V. Kalinin, P. Maksymovych

Polarization domains in the layered ferroelectrics $CuInP_2(S,Se)_6$

10:50–11:20 **Edvardas Kazakevičius**, V. Venckutė, S. Kazlauskas, A. Kežionis, R. Korobko, T. Šalkus

High frequency impedance spectroscopy study on Gd-DOPED CeO_2 thin films

11:20–12:00 *Coffee break*

12:00–12:20 **Ihor Studenyak**, M. Luchynets, V Izai, A. Pogodin, O. Kokhan, A. Kežionis, T. Šalkus, J. Banys

Phase transitions in Cu_6PS_5Br-Cu_7PS_6 mixed crystals

12:20–12:40 I. Anusca, S. Balčiūnas, P. Gemeiner, Š. Svirskas, M. Sanlialp, G. Lackner, C. Fettkenhauer, J. Belovickis, V. Samulionis, M. Ivanov, B. Dkhil, **Jūras Banys**, V. V. Shvartsman, D. C. Lupascu

Dielectric Response of the Methylammonium Lead Halide Solar Cell Absorbers

12:40–13:00 **Saulius Kazlauskas**, E. Kazakevičius, A. Kežionis

Electrical properties of scandia- and ceria-stabilized zirconia ceramics

13:00–14:00 *Lunch*

14:00–14:20 **Alexander Grabar**, M. V. Tsyhyka, and I. M. Stoika

Dynamic interferometry using Sb-doped $Sn_2P_2S_6$ photorefractive crystals

14:20–14:40 **Ilona Zamaraite**, A. Dziaugys, J. Banys, Yu. Vysochanskii

Investigation of physical properties of phosphorous chalcogenide crystals

14:40–15:10 *Coffee break*

15:10–17:00 Poster session

17:00 *Dinner*

POSTER

PRESENTATIONS

STRUCTURAL AND ELECTRICAL PROPERTIES OF ARGYRODITE-TYPE Cu_7PS_6 CRYSTAL

Tomas Šalkus[1], Algimantas Kežionis[1], Jūras Banys[1], Vitalii Yu. Izai[2], Artem I. Pogodin[2], Oleksandr P. Kokhan[2], Vasyl I. Sidey[2], Marijan Yu. Sabov[2], Ihor P. Studenyak[2]

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Cu_7PS_6 crystals were grown using direct crystallization from melt (Bridgman-Stockbarger technique). The synthesis of Cu_7PS_6 compound was performed in the following way: heating at a rate of 50 K/h to 673 ± 5 K and ageing for 24 h, then heating to 973 ± 5 K and ageing for 72 h, further heating up to 1380 ± 5 K (50 K above the melting temperature) and ageing for 24 h. The ageing resulted in nucleation. The growth rate was kept at 3 mm/day. The annealing zone temperature was 973±5 K and the annealing duration was 48 h. As a result, Cu_7PS_6 crystals with the length of 45–50 mm and 10– 2 mm in diameter were obtained.

Cu_7PS_6 was investigated using X-ray powder diffraction technique. Cu_7PS_6 crystallizes into cubic structure (space group $P2_13$ (No.198), lattice parameter a = 9.6706(1) Å, Z = 4. The crystal structure of the Cu_7PS_6 contains cation–anion coordination shell of four different types: $[PS_4]$, $[CuS_4]$, $[CuS_3]$, and $[CuS_2]$. The split position of a copper atom, resulting in two 12b positions (Cu2 and Cu3) with partial site occupancies was determined.

Electrical parameters of Cu_7PS_6 crystal were studied in the frequency range 10–10^{10} Hz and temperature interval 296–351 K by coaxial line impedance spectrometer set-up [1]. Two relaxation processes were found in the spectra of Cu_7PS_6 crystal electric properties. The conductivity dispersion regions are related to these processes. Cu^+ ions and electrons/holes contribute to the conductivity in Cu_7PS_6 crystal.

Acknowledgement

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Literature

[1] A. Kezionis, S. Kazlauskas, D. Petrulionis, A.F. Orliukas, IEEE Trans. Microw. Theory Tech. **62**, 2456 (2014).