

# Contents

---

---

## Vol. 1, No. 1, 2007

Simultaneous English language translation of the journal is available from Pleiades Publishing, Ltd.

Distributed worldwide by Springer. *Journal of Surface Investigation. X-ray, Synchrotron and Neutron Technique* ISSN 1027-4510.

---

---

### Source Focusing and Coherent Imaging of a Microscopic Object at Weak Spatial Coherence of the Synchrotron Radiation Beam

*A. A. Snigirev, V. G. Kohn, E. Kh. Mukhamedzhanov, I. I. Snigireva, A. G. Maevskii, V. V. Kvardakov, and M. V. Kovalchuk* 1

### Multilayer X-ray Mirrors Based on $W/B_4C$ with Ultrashort ( $d = 0.7\text{--}1.5$ nm) Periods

*Yu. A. Vainer, E. B. Kluenkov, A. E. Pestov, K. A. Prokhorov, N. N. Salashchenko, A. A. Fraerman, V. V. Chernov, and N. I. Chkhalo* 7

### Spectroscopy of Homogeneous Deuterated Hydrocarbon Films Redeposited from a T-10 Tokamak Plasma Discharge

*N. Yu. Svechnikov, V. G. Stankevich, A. M. Lebedev, K. A. Men'shikov, B. N. Kolbasov, and V. V. Kriventsov* 13

### UPS and EELS Study of Zirconium Oxidation

*V. G. Nazin, M. N. Mikheeva, M. Yu. Kuznetsov, E. G. Maksimov, and M. V. Magnitskaya* 18

### Application of XAFS Spectroscopy to Studying the Microstructure and Electronic Structure of Quantum Dots

*S. B. Erenburg, N. V. Bausk, A. V. Dvurechenskii, Zh. V. Smagina, A. V. Nenashev, A. I. Nikiforov, V. G. Mansurov, K. S. Zhuravlev, and A. I. Toropov* 26

### Structure and Properties of ZnSe Nanocomposite Thin Films

*R. G. Valeev, P. N. Krylov, and E. A. Romanov* 35

### Local Atomic Structure of $Cu(In_xGa_{1-x})Se_2$ ( $x = 0.25, 0.5, \text{ and } 0.75$ ) Systems for Solar Cells

*A. N. Deev, R. G. Valeev, F. Z. Gil'mutdinov, and D. E. Gai* 40

### Electron Beam Induced Current Investigation of Planar Photodiode Structures on InSb Crystals

*V. P. Astakhov, M. V. Astakhov, V. V. Karpov, and E. B. Yakimov* 44

### Peculiarities of the Formation of the X-ray Diffraction Image of a Surface Acoustic Wave in Grazing Geometry

*L. V. Levonyan and G. K. Khachatryan* 49

### Synchrotron Investigations of the Electron Structure of Silicon Nanocrystals in a $SiO_2$ Matrix

*V. A. Terekhov, S. Yu. Turishchev, V. M. Kashkarov, E. P. Domashevskaya, A. N. Mikhailov, and D. I. Tetel'baum* 55

### High-temperature Tests of Fine-Grained Dense Graphite Composites to Predict the Lifetime of a Neutron Target Converter

*E. I. Zhmurikov, A. I. Romanenko, P. V. Logachev, K. V. Gubin, O. B. Anikeeva, and Tecchio Luigi* 60

### Properties of GaAs/InGaAs Quantum-Size Structures Containing $\delta$ (Mn)-Doped Layers

*O. V. Vikhrova, Yu. A. Danilov, Yu. N. Drozdov, B. N. Zvonkov, F. Iikawa, and M. J. S. P. Brasil* 64

### Structure of $Al_2O_3$ Thin Layers Synthesized on the Silicon Surface by Atomic Layer Deposition

*S. V. Bukin and A. S. Shulakov* 67

### Taking into Account Channels of Focused Intensity Losses for Refractive Optics Elements

*L. G. Shabel'nikov* 71

### Intrinsic Symmetry of Refracting Profiles Derived from a Parabola

*V. V. Aristov and L. G. Shabel'nikov* 76

Nonlinear Properties of Two-Dimensional Semiconductor Superlattices in Biharmonic Fields	81
<i>Yu. Yu. Romanova, A. A. Ryzhova, Yu. A. Romanov, and I. V. Keleinov</i>	
Atomic Force Microscopy Study of the Degradation Mechanism of Ultrathin HfO <sub>2</sub> Layers on Silicon during Vacuum Annealing	84
<i>A. S. Baturin, A. V. Zenkevich, Yu. Yu. Lebedinskii, N. Yu. Lyubovin, V. N. Nevolin, and E. P. Sheshin</i>	
Structure of the Ground State of Electrons and Holes in a Silicon Quantum Dot with a Shallow Donor	90
<i>V. A. Belyakov and V. A. Burdov</i>	
Formation of X-ray Images by Means of Thermal Action of a Light Beam on the Surface of a Diffracting Crystal	94
<i>V. N. Trushin, A. S. Markelov, E. V. Chuprunov, and A. A. Zholudev</i>	
DICSI Station at KCSR and NT: Determination of Optimal Requirements to the Formation of an SR Beam Using Cylindrical X-ray Optical Zoom Lenses	99
<i>V. N. Korneev, P. M. Sergienko, V. A. Shlektarev, V. M. Aul'chenko, M. A. Bukin, V. M. Titov, B. P. Tolochko, M. R. Sharafutdinov, A. V. Zabelin, E. I. Litvinov, A. M. Matyushin, V. G. Stankevich, M. A. Sheromov, O. V. Naida, and A. A. Vazina</i>	
AFM and TEM Study of the Surface of Zirconium Cans of Fuel Elements	105
<i>T. M. Poletika, E. V. Yudina, S. L. Girsova, and N. V. Girsova</i>	
Magnetic Properties of Multiwall Carbon Nanotubes and Astralenes in Strong Electric Fields	110
<i>A. N. Brozdnichenko, A. N. Ponomarev, V. P. Pronin, and V. V. Rybalko</i>	
Refinement of Hydrogen Positions in (NH <sub>4</sub> ) <sub>2</sub> SeO <sub>4</sub>	113
<i>L. S. Smirnov, G. Melnyk, N. Zink, K. Wozniak, P. Dominiak, A. Pawlukojc, L. A. Shuvalov<sup>‡</sup>, and A. Loose</i>	

---