

**Neutron Facilities & Advanced Neutron Sources and Perspective Experiments**

**Development of Transportable Accelerator-Driven Neutron Source in XJTU**

*Wang S., Li H.P., Li X.B., Ma B.L., Yang S.H., Lv Y.S., Qiao Z.P., Hu Y.C., Jiang Q.X., Hu J.Q.* ..... 11

**Neutron Detection & Methodical Aspects**

**Characteristics of Position-Sensitive Plastic Scintillation Detectors**

*Dabylova S.B., Simbirtseva N., Grozdanov D.N., Fedorov N.A., Yergashov A., Dashkov I.D., Kopatch Yu.N., Sedyshev P.V., Ruskov I.N., Skoy V.R., Tretyakova T.Yu., and TANGRA collaboration* ..... 17

**Reconstruction of a HPGe Detector Modeling for Efficiency Calibration**

*Zhang Changfan, Hu Guangchun, Zeng Jun, Xiang Qingpei, Gong Jian* ..... 25

**Neutron Radiation Effects & Radiation Transportation and Simulation**

**Investigation of Waste Management of Control Rod, Irradiation Boxes, and Steel Lining of Tehran Research Reactor after Decommissioning**

*Gholamzadeh Z., Joz Vaziri A., Mirvakili S.M.* ..... 37

**Investigation of Heavy Water Loading in Neutron Beam Channel of Tehran Research Reactor to Decrease Fast Neutron Background at Diffraction Table**

*Gholamzadeh Z., Bavarnegin E., Joz Vaziri A., Safaei Arshi S., Mirvakili S.M.* ..... 45

**Nuclear and Related Analytical Techniques in Environmental and Material Sciences**

**Important Tools in Air Quality Study: Moss Biomonitoring, Atmospheric Deposition, Trace Elements Content and Data Analysis**

*Allajbeu Sh., Qarri F., Bekteshi L., Stafilov T., Frontasyeva M., Lazo P.* ..... 55

<b>Application of Neutron Resonance Capture Analysis for the Investigation of the Element Composition of the Panel from the Triptych (Presumably 17th Century)</b>	
<i>Simbirtseva N.V., Sedyshev P.V., Mazhen S.T., Yergashov A., Dmitriev A.Yu., Ivchenkov V.L.</i> .....	66
<b>Lithium Level in the Prostate of the Normal Human: A Systematic Review</b>	
<i>Zaichick V.</i> .....	72
<b>Measurement of Ca, Cl, K, Mg, Mn, Na, P, Sr Contents and Ca/P Ratio in the Enamel of Permanent Teeth of Teenagers Using Neutron Activation Analysis</b>	
<i>Zaichick V.</i> .....	79
<b>Age-Related Changes of Iodine/Trace Element Content Ratios in Intact Thyroid of Males Investigated by Energy Dispersive X-Ray Fluorescent Analysis</b>	
<i>Zaichick V.</i> .....	84
<b><u>Nuclear Fission</u></b>	
<b>Improvement of the Experimental Capability in Studies of the Cluster Effects in Heavy Nuclei</b>	
<i>Kamanin D.V., Pyatkov Yu.V., Pospíšil S., Rudenko M.O., Alexandrov A.A., Alexandrova I.A., Burian P., Goryainova Z.I., Holík M., Kuznetsova E.A., Korsten R., Meduna L., Ososkov G.A., Solodov A.N., Strekalovsky A.O., Strekalovsky O.V., Zhuchko V.E., Falomkina O.V., Pyt'ev Yu.P.</i> .....	93
<b>Hidden Variables in Angular Correlations of the Particles Emitted in Fission</b>	
<i>Karpeshin F.F.</i> .....	100
<b>Post Scission Neutron Emission and Transformation of Fission Fragments Yield: Are the Regularities?</b>	
<i>Maslyuk V.T., Parlag O.O., Romanyuk M.I., Lengyel O.I., Pop O.M., Svatyuk N.I.</i> .....	106
<b>Parameterization of Neutron Yields for the First Chance Photofission Fragments</b>	
<i>Oleynikov E.V., Lengyel A.I., Maslyuk V.T., Parlag O.O., Pylypczhynec I.V.</i> .....	116

## Fundamental Properties of the Neutron & UCN

### **A Possible Neutron-Antineutron Oscillation Experiment at PF1B at the Institut Laue-Langevin**

*Gudkov V., Klinby E., Meirose B., Milstead D., Nesvizhevsky V.V., Protasov K.V., Rizzi N., Santoro V., Snow W.M., Wagner R., Yiu S.-C.* ..... 127

### **Review of the Experiments Related to the Radiative Neutron Decay**

*Khafizov R.U., Kolesnikov I.A., Nikolenko M.V., Tarnovitsky S.A., Tolokonnikov S.V., Torokhov V.D., Trifonov G.M., Solovei V.A., Kolkhidashvili M.R., Konorov I.V.* ..... 146

### **The Problem of Creating Neutron Matter and Hyperheavy Nuclei in the Laboratory. Possible Instrumental Approach**

*Ryazantsev G.B., Vysotskii V.I., Lavrenchenko G.K., Nedovesov S.S.* ..... 159

### **On History of the Fermi Pseudopotential Concept in Atomic and Neutron Physics**

*Sharapov E.I.* ..... 169

### **Reactions with Neutrons, Properties of Compound States, Nuclear Structure**

#### **Isomeric Ratios in Several Inverse ( $\gamma, n$ ) and ( $n, \gamma$ ) Reactions**

*Bui Minh Hue, Tran Duc Thiep* ..... 179

#### **Capture Neutron Cross Sections Measurements of Rare Earth Isotopes**

*Djilkibaev R.M., Khliustin D.V.* ..... 186

#### **Generation of Radiocarbon C-14 in the Air in Conditions of Thunderstorms**

*Lyashuk V.I.* ..... 197

#### **Analysis of Scattering Phase Shifts for Two-Cluster Systems**

*Odsuren M., Khuukhenkhuu G., Sarsembayeva A., Davaa S., Saikhanbayar Ch., Munkh-Erdene T., Batmyagmar J., Battsooj N.* ..... 203

#### **Fast Proton Induced Processes on Natural Indium**

*Oprea C., Mihul A., Oprea I., Zgura S., Potlog M., Neagu A.* ..... 208

## **Alpha Emission in Fast Neutrons Reaction on Neodymium Nucleus**

*Oprea C., Oprea A.* ..... 216

## **Systematical Analysis of ( $n, 2n$ ) Reaction Cross Sections for 14–15 MeV Neutrons**

*Saikhanbayar Ch., Khuukhenkhuu G., Odsuren M., Gledenov Yu.M., Sansarbayar E., Guohui Zhang* ..... 222

## **Excitation Functions of Neutron-Induced Reactions of Medical Isotopes**

$^{32}\text{P}$ ,  $^{55}\text{Fe}$ ,  $^{74}\text{As}$ ,  $^{97}\text{Ru}$ ,  $^{103}\text{Ru}$  and  $^{109}\text{Pd}$

*Singh N., Gandhi A., Sharma A., Choudhary M., Kumar A.* ..... 227

## **Neutron Resonances in the Global Constituent Quark Model**

*Sukhoruchkin S.I., Soroko Z.N., Sukhoruchkina M.S., Sukhoruchkin D.S.* ..... 234

## **Fundamental Aspects of Neutron Spectroscopy**

*Sukhoruchkin S.I., Soroko Z.N., Sukhoruchkina M.S.* ..... 247

## **Nonstatistical Effects in Resonances of Heavy Nuclei**

*Sukhoruchkin S.I., Soroko Z.N., Sukhoruchkina M.S.* ..... 259

## **An Inverse-Problem Solving by the Example of $^{238}\text{U}(n, 2\gamma)^{239}\text{U}$ Reaction Analysis**

*Sukhovojoj A.M., Mitsyna L.V., Hramko C.* ..... 271