CONTENTS

1

ELEMENTARY PARTICLE PHYSICS. EXPERIMENT

Status of experimental search for electric dipole moment of neutron 6
Estimate of electric polarizability of neutron in Coulomb field of heavy nucleus 7
Preliminary results of neutron lifetime measurements with gravitation UCN trap 9
New measurements of electron-spin asymmetry 10
Measurement of strong crystal electric field through Schwinger interaction of diffracted neutrons 12
Status of experiments to search for P,T-violations in molecules 14
First physics runs of L3 detector at LEP 15
Measurement of production polarization and magnetic moment of Ξ hyperon 19
Observation of K^-—C atomic X-rays with crystal-diffraction spectrometer at 70 GeV IHEP accelerator 20
Polarization in scattering of polarized protons on polarized proton target at 950 MeV 22
Study of reaction $pp \to pp\pi^0$ in energy region 600—900 MeV 24
Measurement of spin rotation parameters R and A in πp elastic scattering in region of low-lying pion-nucleon resonances 25
Study of deuteron structure in quasielastic break-up reaction $pd \to ppn$ in complete kinematics at 1 GeV 27
Measurement of polarization parameters for reaction $\vec{d}p \to \vec{p}pn$ in complete kinematics 28
Test of charge symmetry in $(\pi^{\pm}d)$-elastic scattering at $T_\pi = 417$ MeV energy 30
Search for narrow dibaryon resonances in deuteron break-up reaction $pd \to ppn$ at 1 GeV in complete kinematics experiment 31
Hyperon radiative decays 33
Charmed baryon production in FNAL hyperon beam 35
Heavy quark physics at UNK 36
Neutrino laboratory at Rovno Electric Power Station 38
Ultralow background experimental set-up for Ge-76 double-beta decay search 40
Hydrogen laser streamer chamber 41

2

ELEMENTARY PARTICLE PHYSICS. THEORY

Radiative corrections to the axial anomaly 46
Covariantly homogeneous classical solutions in nonlinear g-models 46
Ward's identities and calculation of multiloop amplitudes in string theory 47
Hierarchy of masses for fermion generations 48
Chiral theory of nucleons 49
Threshold behaviour of heavy top production 50
Long distance behaviour of supersymmetric QCD and Debye screening in instanton vacuum 51

3

NUCLEAR AND ATOMIC PHYSICS. EXPERIMENT

Investigation of electromagnetic moments and charge radii of short-lived rare-earth nuclides with atomic laser spectroscopy 54

Beta-strength functions for decay of $11/2^-$-state in ^{147m}Tb, $^{149}_{67}$Ho, $^{151}_{67}$Ho and superfluid characteristics in Z=64, N=82 region 55

Direct mass measurements of neutron-rich rubidium isotopes 56

Search for delayed fission in neutron-rich nuclei and cosmochronology 57

Quasi-elastic proton scattering on ^{28}Si and ^{34}S at 1.0 GeV 58

Measurement of parity violation in reaction ^{6}Li(n,α) ^{3}H with polarized neutrons 61

Left-right asymmetry of light fragment emission in ^{239}Pu fission by transversally polarized neutrons with energies $0.03 \leqslant E_n \leqslant 8$ eV 63

Investigation of p-resonance properties in slow neutron fission of ^{235}U 64

Experiment for direct measurement of final sticking ω_s in muon catalyzed dt-fusion 66

The experimental investigation of muon catalyzed dd- and pd- fusion 68

Measurements of 1 GeV proton fission cross sections for heavy nuclei 70

Formation mechanisms for massive fragments produced in relativistic proton interaction with heavy nuclei 71

Kinematical analysis of products of ternary fission 72

Differential cross section of reactions ^{7}Li(γ,t) ^{4}He, ^{7}Li(γ,t)X and ^{7}Li(γ,He)X, initiated by virtual photons with energy $E_\gamma = 40 \pm 2$ MeV 74

Low-lying ^{128}I excited states from (n,γ)-reaction 76

Search for correlated groups of particles produced in interactions of neon-22 nucleus with nuclei in photoemulsion 77

Few-nucleon effects in binding energies of nuclei 78

Study of hydrogen isotope adsorption by synthetic zeolites in extended temperature range 79

Synthesis and analysis of iodine-123 labelled ω-iodoundecanoic and ω-iodopentadecanoic acids . 80

LNPI synchrocyclotron proton beams in stereotactic radiosurgery practice 82

4

NUCLEAR AND ATOMIC PHYSICS. THEORY

P-odd effects in ground state hyperfine transitions of hydrogen, potassium and caesium 84

Violation of time-invariance in atomic physics 84

Scattering of mesic atoms on molecular hydrogen targets at low energies 85

Two-level adiabatic approximation calculation for reaction of isotope exchange of metastable mesic atom and hydrogen atom 86

Formation of hydrogen mesic molecules at moderate gas density 87

Effects of quark statistics on charge form factor of ^{4}He nucleus 88

Shape coexistence and radii of transitional nuclei 90

5

PHYSICS OF CONDENSED MATTER. EXPERIMENT AND THEORY

On the nature of two-dimensional short-range ordering in $YBa_2Cu_3O_{7-\delta}$ 94

Search for magnetic fluctuations in superconducting $La_{1,83}Sr_{0,17}CuO_4$ by polarized neutron scattering 96

Peculiarities in temperature dependence of structural parameters of high-T_c 1—2—3 superconductor based on samarium zero-matrix 97

Small-angle neutron scattering and fractal properties of superconducting ceramics $YBa_2Cu_3O_{7-\delta}$ 99

Magnetic properties of La—Sr—Cu—O superconductor at small magnetic fields 101

Study of mixed state of $YBa_2Cu_3O_{6.9}$ superconducting ceramics by method of thermal neutron depolarization 102

Investigation of superconductivity and magnetism in ceramic $YBa_2Cu_3O_{6+x}$ sample 104

Anisotropy of magnetic properties of textured superconductor $Bi_2Sr_2CaCu_2O_{8-\delta}$ 106

The investigations the low-field critical state in the ceramic Y—Ba—Cu—O 108

On voltage fluctuations in resistive state of superconducting Y—Ba—Cu—O ceramics 110

Mossbauer study of ^{129}I in high T_c superconductor $YBa_2Cu_3O_6I_x$ 111

^{129}I Mossbauer study of the organic superconductor β^* — $(BEDT\text{-}TTF)_2I_3$ 113

Electronic structure of copper in high-temperature superconducting ceramics 115

Double 4f-collapse at phase isomorphic transition in $Ce_{0.9-x}Yb_xTh_{0.1}$ 116

Aberration-free diffraction-grating neutron interferometer 118

Search for ferromagnetic ordering in liquid ^3He by polarized neutrons 119

Neutron diffraction study of martensite transformation in Fe—Ni—C alloys 120

Role of intrinsic point defects in creation of deep level defects 122

Equivalent states of muonium and implanted hydrogen in silicon 124

Microscopic nature of lithium interaction with acceptor-type defects in silicon 125

Use of electron-positron annihilation in studies of extended defects of disordered regions type in Ge and Si 127

Electroneutrality principle and conductance fluctuations in solutions of strong electrolytes 128

Detector system for high resolution diffractometer of «SFINKS»-type 129

Magnetic and neutron diffraction study of the reentrant temperature transition «Heisenberg antiferromagnetic-spin glass» 131

Theory of antiferromagnetic spin glasses and strongly disordered antiferromagnets 132

Theory of nonergodicity and nonequilibrium properties of structural and spin glasses in quantum case 133

Passage of polarized neutrons through magnetic media 134

Neutron mirror superpolariser: principle and calculation 134

Specification of redox process part in electrochromism of lanthanide diphtalocyanines 136

6

MOLECULAR AND RADIATION BIOPHYSICS

Thermodynamics of translocation and functional role of E site 140

Puromycin reaction at A site of 70S ribosomes 141

New structures of oxidized dextranes 143

Study of 5-hydroxydihydrouracil formation at polyU radiolysis 143

Investigation of radiation induced exidation of thiol compounds in aqueous solutions 145

Biotic and environmental stability 147

Modified method of purification of thermophilic polynucleotide phosphorylase retaining its phosphorolytic activity after immobilization 148