Contents

PAGE

Preface 1

Structure of Matter: Nuclear and Hadron Physics 3

The Dilepton Spectrometer HADES at SIS/GSI Darmstadt in Operation 5

Sub-Threshold Phi Meson Production in the Reaction Ni$\,(1.93\,A{\cdot}\mathrm{GeV}) + \mathrm{Ni}$ 7

Inclusive K-meson and Pion Production in Proton-Nucleus Collisions at SIS Energies 8

Hyperon-Nucleon Bound States and the Electroproduction of Strangeness on $^{3,4}He$ 10

In-Medium Spectral Change of ω Mesons as a Probe of Four-Quark Condensate 11

Modifications of the Di-Electron Spectra from ϕ Meson Decays 12

Tagging the $pn \to d\phi$ Reaction by Backward Protons in $pd \to d\phi p_{sp}$ Processes 13

Measuring the Effect of ϕ Meson Life Time in Proton-Nucleus Collsions 14

Nucleon-K$^+$ Correlations in Deuteron Induced Collisions with Nuclei at Intermediate Energies 15

Strangeness Saturation: Dependence on System-Size, Centrality and Energy within the Thermal Model 16

Energy Loss of Charm Quarks by Gluon Radiation 17

Relativistic Effects in Deuteron Break-Up Reactions 18

Exclusive Charge-Exchange Reaction $pD \to n(pp)$ within the Bethe-Salpeter Formalism 19

From QCD Lattice Calculations to the Equation of State of Quark Matter 20

Quality Assessment for Monitoring of HADES DST Production 21

A Method for Separation of Faulty Wire Connections in the HADES Drift Chambers 22

Examination of the Wire Deflections for the HADES Drift Chambers MDC III 23

Momentum-Reconstruction System for ANKE Side Detectors 25

ELBE-n-TOF: Comparison to other Neutron Sources and Experiments 26

Detector Setup for Nuclear-Resonance-Fluorescence Experiments at ELBE 27

Collimators for the BGO Escape-Suppression Shields 29

Radiator for the Production of Bremsstrahlung at ELBE 30

Steering Magnets for the Production of Polarized Bremsstrahlung at ELBE 31

Beam Separation Magnet of the Bremsstrahlung Facility at ELBE 33

Dipole Excitations in ^{98}Mo 34

Nuclear Resonance Fluorescence Experiments on ^{100}Mo 35

Simulations for a Double Time-of-Flight Spectrometer for Fission Fragments 36

A Time Coincidence Test Setup for an MCP Detector 37

Secondary Electron Trajectories for an Electrostatic Mirror 38

Measuring Foil Thicknesses for a Time-of-Flight Spectrometer 39

Probing the Gateway to Superheavy Nuclei in Cranked Relativistic Hartree-Bogoliubov Theory 40

Proton-Neutron Pairing in Rotating $N \approx Z$ Nuclei 41

Beta-Decay Studies of Neutron-Deficient Tin Isotopes 42

Beta Decay of ^{103}Sn 43

Gamma-Ray Spectroscopy of Fission Fragments with Super Clover Ge Detectors 44

Study of the Neutron-Rich Isotopes ^{91}Sr and ^{92}Sr in a Fusion-Fission Experiment 45

Life Sciences: Biostructures and Radiation 47

Installation of Biochemical and Biophysical Working Facilities at the IKH 49

Whole Cell Characterisation by Second-Derivative FTIR Spectroscopy for the Detection of Radiation Damage 50

Analysis of Structural Flexibility in S-Layer Proteins from *Bacillus Sphaericus* 51

Investigation of Structure and Function of the Visual Photoreceptor Rhodopsin 52

Analysis of Dye DNA Interactions 53

Experimental Set-Up for IR Measurements of Dynamics of Water-Lipid Interaction 54

Infrared Characterization of Environmental Samples by Pulsed Photo-Thermal Spectroscopy 55

Using Pulsed Photo-Thermal Spectroscopy for Microspectroscopy in the Infrared Region. A First Approach 56

Temperature Stabilization of the Out-Coupling Mirror Wheel 57

A Four Pole Magnetic Chicane for Phase Matching 58

New Elements of the GPT Code to Simulate a Resonator Free-Electron Laser 59

Start-Up Simulations of the Spectral and Spatial Evolution of the ELBE FEL 60

Simulation of Limit Cycle Oscillations in the U27 FEL 61

Dynamics of Matrix–Isolated Molecules 62

Clonogenic Survival of Mammary Epithelial Cells MCF-12A after Irradiation with 200 kV X-Rays 64

Influence of the Handling Procedure During Irradiation on Cell Survival and Micronucleus Test Results 65

Measurements of Spectral Dose Distributions of a Soft X-Ray Tube 66

Changing the Dose Range of TSEE Dosimeters 67

An X-Ray Monochromator for the Channeling Source at ELBE 68

The Influence of Electron Scattering in the Target on the Beam Transmission 69

Background at the Radiation Physics Beam Line 70

Shielding Calculations for an X-Ray Laboratory 71

Comparison of Bremsstrahlung Distributions with Results from Monte-Carlo Codes 72

Calculation of Photon-Induced Auger Transitions in Tc and Re 73

Auger Electron Emission in Tc: Photon Induced versus Radioactive Decay 74

Dose Distributions of Photon-Induced Secondary Electrons in Tc 75

Scatter Correction for In-Beam PET Monitoring of Heavy Ion Therapy 76

The Time Dependence of the γ-Ray Intensity Seen by an In-Beam PET Monitor 77

The Quantification of the Mechanical Deformation of the Rotating Double Head PET Scanner at the ^{12}C Ion Therapy Facility at GSI Darmstadt 78

Nuclear Reaction Cross Sections for the Assessment of Positron Emitter Generation by Therapeutic Irradiations with ^{4}He Beams 79

Hamamatsu S8550 APD Arrays for High-Resolution Scintillator Matrices Readout 80

Position Sensitive Photon Detectors of Lutetium Oxyorthosilicate Crystals Coupled to Avalanche Photodiode Arrays 81

A CAMAC Data Acquisition System for Multi Parameter Measurements 82

A Technical Feasibility Study for a PET Therapy Monitor Combined with a Rotating Ion Beam Delivery 83

Author Index 85

Publications and Talks 87

Publications 89

Proceedings and Reports 98

Theses 101

Talks at Conferences and other Institutes 102

Talks at Rossendorf 107

Talks of Visitors 108

Meetings organized by the IKH 110

Personnel 111

Personnel of the Institute for Nuclear and Hadron Physics 113

Guest Scientists 114