

# 高能物理与核物理 第2卷 1978年

## 总 目 录

### 第 1 期

- 一种  $SU(4) \times S_3^c$  层子模型方案 ..... 北京大学物理系基本粒子理论组 (1)
- 原子核的单粒位阱(II) 非厄米选择 ..... 吴式枢 (10)
- 关于非亚贝尔规范群的对偶荷(单磁荷)问题(II) ..... 李华钟、郭硕鸿、冼鼎昌 (23)
- 旋量磁单极解是允许的 ..... 王明中、郑希特、汪克林、章正刚、冼鼎昌 (35)
- 四元轻子模型分析及非对角的中性流 ..... 吴丹迪、伍经元、李小源 (42)
- 变速运动磁单极场强的各种表式及磁单极势的积分形式 ..... 杜东生、阮图南 (49)
- 具有同样  $SU(2)$  场强与外源的不等价规范势 ..... 侯伯宇 (61)
- 关于某些偶偶核的回弯现象的机理 ..... 张敬业、李君清、高元义 (67)
- 核子激发态  $\Delta(1232)$  在核内的平均场 ..... 张宗焯、王英才 (75)
- $^{240}\text{Po}$  形状同质异能态 ..... 中国科学院原子核研究所核物理研究室裂变组 (83)

#### 研究简报

- 关于  $SU(2)$  瞬子方程的一点注记 ..... 吴咏时、彭家贵 (87)
- “色空间”中介子和重子的质量分裂 ..... 高崇寿 (90)
- 经线形式的磁单极子势 ..... 朱栋培 (93)

### 第 2 期

- 规范场理论的环路位相因子方法 ..... 谷超豪 (97)
- 层子间近平底势作用下的赝标介子波函数 ..... 王明中、郑希特、汪克林、章正刚、冼鼎昌 (109)
- 复合粒子量子场论的微扰展开和规范不变问题 ..... 张肇西、何祚庠 (119)
- 参数估计的置信密度方法 ..... 李惕碛 (131)
- $^{12}\text{C} + ^{209}\text{Bi}$  生成的 Fr 和 At 同位素激发函数测量 ..... 郭俊盛、孙锡军、徐晓冀、王 隽、刘洪业 (143)
- $^{12}\text{C} + ^{27}\text{Al}$ ,  $^{12}\text{C} + ^{209}\text{Bi}$  和  $^{14}\text{N} + \text{Pb}$  反应全熔合截面测量 .....  
..... 孙其昌、何 易、沈菊生、陈 厚、陈克良 (151)
- 原子核多体问题的玻色子-费米子描述 ..... 杨泽森、钟毓澍、齐 辉、杨立铭 (158)

#### 研究简报

- 1P 壳超核激发态的一些特性 ..... 厉光烈、沈建平、张宗焯 (168)
- 粲 (Charm) 粒子的质量谱 ..... 罗辽复、陆 垓 (174)
- 自发破坏的类  $\mu$  荷对称重轻子和  $\mu \rightarrow e + \gamma$  ..... 吴丹迪、李小源 (178)
- 9.5GeV 附近的新粒子  $\Upsilon$  和层子模型的  $SU(5)$  扩充 ..... 李铁忠 (183)
- $\Upsilon(9.5)$  可能是颜色激发态 ..... 朱重远、陈 时 (188)

### 第 3 期

- N-O 模型弦型解附近的量子展开 ..... 殷鹏程 (193)
- 用量纲分析法求解太阳宇宙线扩散对流方程 ..... 章公亮 (200)
- 介子束缚态方程及其解的进一步探讨 ..... 高 嵩 (211)
- 关于相对论量子力学中某些相角不定性的消除 ..... 戴显熹、倪光炯 (225)
- $\tau \rightarrow \pi \nu_\tau$  疑难和自旋  $3/2$  的  $\tau$  轻子 ..... 伍经元、李小源、陈中谟 (236)
- 核裂变碎片角分布与鞍点核形状 ..... 刘国兴、王志国、尹淑芝、郝斌干、袁双贵、夏星硕 (242)
- $^{12}\text{C}(d,d)^{12}\text{C}$  及  $^{12}\text{C}(d,p)^{13}\text{C}^*$  反应机制的研究 ..... 韩文述、庄 斐、和 音 (249)
- 铅(208) $1^+$ 态的精细结构 ..... 傅德基、方 宝 (263)
- $^6\text{Li}$  基态中氘的压缩和变形 ..... 陈永寿、卢兆启、巫光汉 (267)

#### 研究简报

- 弯曲空间的  $SU(N)$  规范理论的磁单极子与双子解 ..... 汪克林、冼鼎昌、郑希特 (275)
- $^{16}\text{O}$  巨偶极共振的精细结构 ..... 余友文、朱熙泉、吴慧芳 (280)
- 关于 B-S 波函数在相对时间趋向无穷大时的渐近行为 ..... 何祚庥、张肇西、黄 涛 (285)

### 第 4 期

- “微观因果律”可以任意破坏吗? ..... 阮图南、何祚庥 (289)
- $SU_N$  规范场中的  $U_1$  规范场和其对偶荷的量子化数值 ..... 谷超豪 (295)
- 含磁荷的奇异原子的能级与定态 ..... 戴显熹 (305)
- 新发现的重粒子  $Y(9.5)$  是什么性质的粒子 ..... 高崇寿 (311)
- 用乳胶室研究超高能  $r$  线 ..... 任敬儒、陆穗苓、苏 实、潘继荣 (318)
- 层子模型里介子和重子的波动方程 ..... 胡 宁 (323)
- 对 Glauber 理论的相对论修正及散射振幅的高能行为 ..... 鲍诚光、赵维勤 (336)
- $^{12}\text{C}$  离子引起  $^{209}\text{Bi}$  和  $^{238}\text{U}$  裂变中质量分布的放射化学研究 ..... 中国科学院近代物理研究所核物理研究室核化学组 (343)
- 原子核裂变统计理论的微观计算 ..... 贺泽君、李盘林 (350)
- 量子系统的主方程 ..... 徐躬耦 (359)

#### 研究简报

- $SU(2)$  规范场的一系列“无源”解  
——静点磁荷系的  $SU(2)$  势及  $U(1)$  势 ..... 王永康、张高有、侯伯宇 (368)
- 关于一种 Yang-Mills 场的类粒子解 ..... 吴咏时、李华钟、郭硕鸿、冼鼎昌 (371)
- 转晕线上的能级密度 ..... 张锡珍 (374)
- 关于电子-磁单极子的经典角动量 ..... 李子平 (378)
- 低能停止粒子探测器 ..... 张英平、唐孝威 (382)

### 第 5 期

- 太阳宇宙线的传播效应 ..... 章公亮 (385)
- $SU(4) \times S^1$  层子模型方案和新发现的重粒子  $Y(9.5)$  ..... 高崇寿 (394)
- $SU(4)$  磁单极子与双子解 ..... 汪克林、冼鼎昌、郑希特 (403)
- 高能朝后势散射 ..... 姜焕清、李扬国 (411)

海拔 3220 米动量大于 4GeV/c 的 $\mu$ 子垂直积分动量谱	.....
... 荆贵茹、霍安祥、袁余奎、王立安、李延国、粟登吉、孟祥承、姚伟忠、周寅藻、冯少华、王丽辉	(417)
高山宇宙线荷电强子流强的负正比	.....
... 徐春娴、霍安祥、袁余奎、顾逸东、李惕碛、沈培若、贾桂斌、肖谦益、张承模、陈端保	(423)
关于“对转动”与“对振动”	..... 曾谨言 (428)
金属氢化物 $ZrH_{1.66}$ 和 $TiH_{1.92}$ 的热中子非弹性散射	.....
... 阮景辉、成之绪、陈桂英、李竹起、陆挺、吴善令	(441)
铁、铜和铅的快中子弹性散射截面	..... 中国科学院原子核研究所核物理研究室中子物理组 (450)

### 研究简报

层子模型里重子的分类	..... 胡宁 (461)
核子 Isobar 的等效相互作用	..... 余友文、吴慧芳 (468)
重子场流关系式和过程 $p + n \rightarrow n + K + \Lambda$	..... 何祚庥、黄涛 (471)
提高醋酸纤维素固体径迹探测器灵敏度的一个新途径	..... 朱润生 (476)
在海拔 3220 米宇宙线中反质子成份的初步测量	.....
... 袁余奎、霍安祥、张长春、覃克宇、朱爱民、张人清、郭可尊、杨长友、李沁莲、范士合	(478)

## 第 6 期

强作用与手征规范场	..... 阮图南、杜东生 (481)
量子色动力学中的动力学自发破缺	..... 邝宇平、易余萍 (488)
规范场的正则量子化 (I)	
— 纯杨-Mills 场	..... 赵保恒、阎沐霖 (501)
非阿贝尔规范势分解的几何表述	..... 段一士、葛墨林 (511)
中微子-质子、中微子-电子弹性散射和弱中性流的时空结构	..... 杜东生、吴济民 (515)
高能核子在原子核散射的自旋效应	..... 李扬国、张禹顺、林春灿 (526)
能量稍高于库仑位垒的 $^{12}C + ^{209}Bi$ 反应的半经典分析	..... 徐树威、冉启惠、马洪范 (534)
一个新型的高频金属离子源	..... 马明修、姚维、白桂彬 (544)
$^{56}Fe(n, p)^{56}Mn$ 反应截面测量	..... 李际周、卢涵林、范培国、马鸿昌、李野砂 (550)

### 研究简报

关于某些偶偶核的回弯现象的机理 II	..... 张敬业 (558)
高自旋介子和宇宙线中的多光子事例	..... 罗辽复、陆焱 (562)
带电重轻子的非对角产生和非对角中性流	..... 伍经元、李小源、吴丹迪 (566)
提高醋酸纤维素固体径迹探测器灵敏度的又一新途径——溶胀增敏	..... 朱润生 (572)

PHYSICA ENERGIAE FORTIS ET  
PHYSICA NUCLEARIS Vol. 2, 1978

CONTENTS

No. 1

- An  $SU(4) \times S_3^c$  Scheme of the Straton Model .....  
*Elementary Particle Theory Group, Department of Physics, Peking University* (9)
- On Nuclear Single-Particle Potentials (II)—the Nonhermitian Choice .....  
..... *Wu Shi-shu* (22)
- On the Problem of the Dual Charge (Magnetic Monopole) of Non-Abelian Groups  
(II) ..... *Lee Hua-chung, Kuo Shuo-hung, Hsien Ting-chang* (34)
- Spinor Monopole Solution is Possible ..... *Wang Ming-chung,  
Cheng Hsi-ten, Wang Ke-lin, Chang Cheng-kang, Hsien Ting-chang* (41)
- An Analysis of Four-Element Models of Leptons and Non-Diagonal Neutral Currents  
..... *Wu Dan-di, Wu Jing-yuan, Li Xiao-yuan* (48)
- Various Expressions for the Field Strengths of a Monopole with Different Velocities  
and the Integral Form of the Potential of a Monopole .....  
..... *Tu Tung-sheng, Ruan Tu-nan* (60)
- Nonequivalent  $SU(2)$  Gauge Potentials under Equal Field Strengths and Sources .....  
..... *Hou Bo-yu* (66)
- On the Mechanism of Backbending Phenomena of some Even Even Nuclei .....  
..... *Chang Jing-ye, Li Juen-ching, Gao Yuan-yi* (74)
- The Average Field of the Isobar  $\Delta(1232)$  in Nuclei .....  
..... *Zhang Zong-ye, Wang Ying-cai* (81)
- The Shape of Isomer  $^{240m}\text{Pu}$  ..... *Fission Group,  
Nuclear Physics Laboratory, Institute of Nuclear Research, Academia Sinica* (86)

Research Notes

- A Note on the Equations of  $SU(2)$  Instantons ..... *Wu Yong-shi, Peng Chia-kwei* (89)
- Mass Splittings of Mesons and Baryons in Colour Space ..... *Gao Chung-shou* (92)
- The Non-Singular Vector Potential of a Magnetic Monopole in the Direction of  
Meridian ..... *Tzu Tung-pei* (96)

No. 2

- The Loop Phase-factor Approach to Gauge Fields ..... *Gu Chao-hao* (108)
- Wave Function of the Pseudoscalar Meson under the Interaction of a Nearly-Flat-  
Bottom Potential Between Stratons ..... *Wang Ming-chung,  
Cheng Hsi-teh, Wang Ke-lin, Chang Cheng-kang, Hsien Ting-chang* (118)
- The Perturbation Expansion of the Quantized Composite Field Theory and Gauge  
Invariance ..... *Chang Chao-shie, Ho Tsu-hsiu* (130)

Confidence Density Method for Parameter Estimation.....	<i>Li Ti-pei</i> (142)
The Measurement of the Excitation Functions of Isotopes of Fr and At, Produced in the Bombardment of $^{12}\text{C}$ on $^{209}\text{Bi}$ .....	..... <i>Guo Jun-sheng, Sun Xi-jun, Xu Xiao-ji, Wang Jun, Liu Hong-ye</i> (150)
The Measurement of Complete Fusion Cross-sections For the Reactions $^{12}\text{C} + ^{27}\text{Al}$ , $^{12}\text{C} + ^{209}\text{Bi}$ and $^{14}\text{N} + \text{Pb}$ .....	..... <i>Sun Chi-chang, He Yi, Shen Jiu-sheng, Chen Hou, Chen Ke-liang</i> (157)
A Boson Fermion Description of the Nuclear Many-body Problem.....	..... <i>Yang Ze-sen, Zhong Yu-shu, Qi Hui, Yang Li-ming</i> (167)

### Research Notes

Some Properties of the Hypernuclear Excited States in 1P Shell .....	..... <i>Li Guang-lie, Shen Jian-ping, Zhang Zong-ye</i> (173)
Mass Spectra of Charm Particles .....	..... <i>Luo Liao-fu, Lu Tan</i> (177)
Spontaneously Broken $\mu$ -Like Charge Symmetry, Heavy Leptons and $\mu \rightarrow e + \gamma$ .....	..... <i>Wu Dan-di, Lee Xiao-yuan</i> (182)
New Particles $\Gamma$ near 9.5GeV and $SU(5)$ Extension of the Straton Model.....	..... <i>Li Tie-zhong</i> (187)
$\Upsilon(9.5)$ may be Colour-Excited States.....	..... <i>Chu Chung-yuan, Chen Shih</i> (192)

### No. 3

Quantum Expansion around the Vertex Type Solution of N-O Model.....	..... <i>Yin Pong-cheng</i> (199)
Dimensional Method to Solve the Diffusion Convection Equation of Solar Cosmic Rays .....	..... <i>Chang Kong-liang</i> (210)
Further Discussion on the Equation and its Solutions for the Bound States of Mesons .....	..... <i>Gao Lun</i> (224)
On the Elimination of Phase Angle Uncertainty in Some Problems of Relativistic Quantum Mechanics .....	..... <i>Dai Xian-xi, Ni Guan-jiong</i> (235)
The Difficulty of the Decay $\tau \rightarrow \pi\nu_\tau$ and Spin 3/2 Heavy Lepton.....	..... <i>Wu Jing-yuan, Li Xiao-yuan, Chen Zhong-mo</i> (241)
Angular Distributions of Fission Fragments and the Shapes of the Saddle Point of Compound Nuclei .....	..... <i>Liu Gou-xing, Wang Zhi-gou, Yin Shu-zhi, Hao Bin-gan, Yuan Shuang-gui, Xia Xing-shuo</i> (248)
Study of the Mechanism of $^{12}\text{C}(d,d)^{12}\text{C}$ and $^{12}\text{C}(d,p)^{13}\text{C}^*$ Reactions.....	..... <i>Han Wen-shu, Chuang Fi, He In</i> (262)
The Fine Structure of $^{208}\text{Pb}$ $1^+$ States.....	..... <i>Fu Te-chi, Fang Pao</i> (266)
On the Contraction and Deformation of Deuteron Cluster in $^6\text{Li}$ .....	..... <i>Chen Yung-sow, Lu Tzow-chi, Vu Gon-han</i> (274)

### Research Notes

On the Magnetic Monopole and Dipole Solution of the $SU(N)$ Gauge Field Theory in a Curved Space .....	..... <i>Wang Ke-lin, Hsien Ting-chang, Cheng Hsi-teh</i> (279)
Fine Structure of the Giant Dipole Resonance in $^{16}\text{O}$ .....	..... <i>Yu You-wen, Tzu Hsi-chuen, Wu Wei-fang</i> (284)

• v •

On the Asymptotic Behaviour of the B-S Wave Function as the Relative Time Approaches Infinity .....*Ho Tso-hsiu, Chang Chao-shie, Huang Tao* (288)

#### No. 4

- Can the Principle of Microcausality be Removed Arbitrarily?.....*Ruan Tu-nan, Ho Tso-hsiu* (294)
- The  $U_1$  Gauge Field in a  $SU_N$  Gauge Field and the Quantized Values of Dual Charges .....*Gu Chao-hao* (303)
- On the Energy Levels and the Stationary States of the Exotic Atoms Containing Monopoles .....*Dai Xian-xi* (310)
- What Is the Nature of the Newly Discovered Heavy Particle  $Y(9.5)$  .....*Gao Chung-shou* (317)
- A Study of Ultra-high Energy  $\gamma$ -rays by Emulsion Chambers .....*Ren Jing-ru, Lu Swei-ling, Su Shih, Pan Ji-rung* (322)
- The Wave Equations for Mesons and Baryons in the Straton Model .....*Hu Ning* (335)
- A Relativistic Correction to the Glauber Theory and the High Energy Behavior of the Scattering Amplitude .....*Bao Cheng-guang, Chao Wei-chin* (342)
- Radiochemical Investigation of Mass Distributions in  $^{12}\text{C}$ -induced Fission of  $^{209}\text{Bi}$  and  $^{238}\text{U}$ .....*Nuclear Chemistry Group, Nuclear Physics Research Laboratory, Institute of Modern Physics, Academia Sinica* (349)
- The Microscopic Calculation of the Statistical Theory of Nuclear Fission .....*He Ze-jun, Lee Pan-lin* (358)
- Master Equation for Quantum Systems .....*Hsu Kung-ngou* (367)

#### Research Notes

- A Series of Sourceless Solution of  $SU(2)$  Gauge Fields—The  $SU(2)$  and  $U(1)$  Potential of Static Monopole Systems .....*Wang Yun-kong, Chang Kuo-yiu, Hou Bo-yu* (370)
- On a Pseudo-particle Solution of the Yang-Mills Field .....*Wu Yong-shi, Lee Hwa-chung, Kuo Shuo-hung, Hsien Ting-chang* (373)
- Level Density Just Above Yrast Line .....*Chang Hsi-chen* (377)
- On Classical Angular Momentum of an Electron-Magnetic Monopole .....*Lee Tze-ping* (381)
- Stop Detector for Low Energy Particles .....*Chang Ying-ping, Tang Xiao-wei* (384)

#### No. 5

- Propagation Effects of Solar Cosmic Rays .....*Chang Kong-liang* (393)
- $SU(4) \times S_3^c$  Scheme of Straton Model and the Newly Discovered Heavy Particle  $Y(9.5)$  .....*Gao Chung-shou* (402)
- On the  $SU(4)$  Monopole and Dyon Solutions .....*Wang Ke-lin, Hsien Ting-chang, Cheng Hsi-teh* (410)
- Backward Potential Scattering at High Energies.....*Chiang Huan-ching, Li Yang-kuo* (416)
- The Vertical Integrated Momentum Spectrum of the Muon with Momentum Larger than 4 GeV/c at 3220m above Sea-level .....

- Jing Gui-ru, Huo An-xiang, Yan Yu-kui, Wang Li-an, Li Yan-guo, Su Deng-ji, Meng Xiang-cheng, Yao Wei-zhong, Zhou Yin-zao, Feng Shao-hua, Wang Li-hui* (422)
- The Negative-Positive Ratio of Charged Cosmic Ray Hadrons at the 3220m above Sea-level ..... *Xu Chun-xian, Huo An-xiang, Yuan Yu-kui, Gu Yi-dong, Li Ti-pei, Shen Pei-ro, Jia Guei-bin, Xiao Qian-yi, Zhang Cheng-mo, Chen Duan-bao* (427)
- On "Pairing Rotation" and "Pairing Vibration"..... *Zeng Jin-yan* (440)
- Inelastic Scattering of Thermal Neutrons by Metal Hydrides  $ZrH_{1.66}$  and  $TiH_{1.92}$ ..... *Ruan Jing-hui, Cheng Zhi-shiuh, Chen Gui-ying, Li Zhu-chi, Lu Ting, Wu Shan-ling* (449)
- Elastic Scattering of Fast Neutrons from Fe, Cu and Pb..... *Neutron Physics Group of Nuclear Physics Laboratory, Institute of Nuclear Research, Academia Sinica* (460)

### Research Notes

- The Classification of Baryons in the Straton Model ..... *Hu Ning* (467)
- The Effective Interaction Between the Nucleon and the Isobar ..... *Yu Yon-wen, Wu Wei-fang* (470)
- The Field-current Relations for Baryons and the Process  $p + n \rightarrow n + K + \Lambda$  ..... *Ho Tso-hsiu, Huang Tao* (475)
- A New Way for Sensitizing Cellulose Acetate Solid State Track Detector..... *Chu Run-sheng* (477)
- Preliminary Measurement of the Antiproton Component in Cosmic Rays at a 3220m Altitude ..... *Yuan Yu-kui, Huo An-xiang, Zhang Chang-chun, Qin Ke-yu, Zhu Ai-min, Zhang Ren-qing, Guo Ke-zun, Yang Chang-you, Li Qin-lian, Fan Shi-he* (480)

### No. 6

- Strong Interaction and Chiral Gauge Field ..... *Yuan Tu-nan, Tu Tung-sheng* (487)
- Dynamical Symmetry Breakings in Quantum Chromodynamics ..... *Kuang Yu-ping, Yi Yu-ping* (500)
- Canonical Quantization of Gauge Fields (I)—The Yang-Mills Field..... *Zhao Bao-heng, Yan Mu-lin* (510)
- Geometrical Description of Decomposibility of a Non-Abelian Gauge Potential ..... *Tuan I-shih, Keh Mo-lin* (514)
- Neutrino-Proton, Neutrino-Electron Elastic Scattering and the Space-time Structure of the Weak Neutral Currents ..... *Tu Tung-sheng, Wu Ji-min* (525)
- Spin Effects in High-Energy Nucleon-Nucleus Scattering ..... *Li Yang-guo, Zhang Yu-shun, Lin Chun-can* (533)
- A Semi-Classical Analysis on the Reaction  $^{12}C + ^{209}Bi$  at Bombarding Energies slightly above the Coulomb Barrier ..... *Xu Shu-wei, Ran Qi-hui, Ma Hong-fan* (543)
- A New Type of Radio-frequency Metal Ion Source ..... *Ma Ming-hsiu, Yao Wei, Pai Kuei-ping* (549)
- Cross Section Measurement for the Reaction  $^{56}Fe(n,p) ^{56}Mn$  ..... *Li Chi-chou, Lu Han-lin, Fan Pei-kuo, Ma Hung-chang, Li Yeh-sha* (557)

### Research Notes

- On the Mechanism of Backbending Phenomena of some Even-Even Nuclei II..... *Chang Jing-ye* (561)
- High Spin Mesons and Unexplained Multiphoton Phenomena .....

..... *Luo Liao-fu, Lu Tan* (565)  
The Production of Charged Heavy Leptons by Non-diagonal Neutral Currents.....  
..... *Wu Jing-yuan, Li Xiao-yuan, Wu Dan-di* (571)  
Another New Way for Sensitizing Cellulose Acetate Solid State Track Detector——  
Sensitizing by Swelling ..... *Chu Run-sheng* (573)