

SESSION INDEX

SESSION S 1 Strong Interactions of Pions and Nucleons (Experimental)	1
SESSION S 2 Strong Interactions of Pions and Nucleons (Theoretical)	209
SESSION S 3 Strong Interactions of Strange Particles	367
SESSION S 4 Weak Interactions	499
SESSION R 1 Strong Interactions of Pions and Nucleons I (photoproduction, pion scattering, pion production)	621
SESSION R 2 Strong Interactions of Pions and Nucleons II (Nucleon and antinucleon processes)	651
SESSION R 3 Strong Interactions of Strange Particles	683
SESSION R 4 Weak Interactions	711
SESSION P 1 Structure of Elementary Particles	755
SESSION P 2 New Results at Superhigh Energies	797
SESSION P 3 Theories of Elementary Particles	841

CONTENTS

SESSION S 1 — Strong Interactions of Pions and Nucleons (Experimental)

<i>Photoproduction of neutral pions and polarization of the recoil protons</i> Salvini, G.	3
<i>A nuclear emulsion experiment to measure the polarization of the recoil proton in the photoproduction of neutral pions in hydrogen</i> Maloy, J. O., Friedman, J. I., Kendall, H., Manfredini, A., Peterson, V. Z. and Salandin, G. A. (presented by Salvini, G.)	14
<i>Photoproduction of positive pions from hydrogen</i> Walker, R. L.	17
<i>A measurement of the presence of the retardation term in pion photoproduction using polarized X-rays of 342 and 373 MeV</i> Smith, R. C. and Mozley, R. F. (presented by Mozley, R. F.)	22

<i>π^+ photoproduction from hydrogen near threshold</i>	23
Rutherford, J. G., Walker, J., Miller, D. and Patterson, J. M. (presented by Bellamy, E. H.)	
<i>Analysis of photopion production near threshold</i>	26
Baldin, A. M.	
<i>An experiment to determine the π^0 lifetime</i>	27
Tollestrup, A. V., Berman, S., Gomez, R. and Ruderman, H. (presented by Tollestrup, A. V.)	
<i>The lifetime of the neutral pion</i>	30
Glasser, R. G., Seeman, N. and Stiller, B. (presented by Tollestrup, A. V.)	
<i>Internal pairs following π^- capture in hydrogen</i>	32
Derrick, M., Fetkovich, J. G., Fields, T. H. and Deahl, J (presented by Fields, T. H.)	
<i>Dynamics of internally converted electron-positron pairs</i>	35
Samios, N. P. (presented by Fields, T. H.)	
<i>Results in pion proton scattering near the higher resonances</i>	38
Falk-Vairant, P. and Valladas, G. (presented by Valladas, G.)	
<i>Production of charged pions in neutron-proton collisions at 590 MeV</i>	46
Dzhelepov, V. P., Kiselev, V. S., Oganesyan, K. O. and Flyagin, V. B. (presented by Dzhelepov, V. P.)	
<i>Check of the charge independence principle in the reaction $d+d \rightarrow \pi^0 + He^4$ at 400 MeV deuteron energy</i>	49
Akimov, Yu. K., Savchenko, O. V. and Soroko, L. M. (presented by Dzhelepov, V. P.)	
<i>Effects of F and G waves on the phase-shift analysis of $\pi^+ - p$ scattering at 310 MeV</i>	52
Foote, J. H., Chamberlain, O., Rogers, E. H. and Steiner, H. M. (presented by Chamberlain, O.)	
<i>A possible anomaly in meson production in $p+d$ collisions</i>	55
Abashian, A., Booth, N. E. and Crowe, K. M. (presented by Crowe, K. M.)	
<i>Experimental data for determining the pion-pion cross section</i>	58
Anderson, J. A., Burke, P. G., Carmony, D. D. and Schmitz, N. (presented by Alvarez, L.)	
<i>π^--neutron total cross section at 136 MeV</i>	61
Derrick, M., Fetkovich, J., Fields, T., Pewitt, E. G. and Yodh, G. B. (presented by Fields, T.)	
<i>The determination of the coupling constant of pion-nucleon interaction by differential cross sections for elastic ($n-p$)-scattering at 90, 380-400 and 630 MeV</i>	64
Amaglobeli, N. S., Kazarinov, Yu. M., Sokolov, S. N. and Silin, I. N. (presented by Tyapkin, A. A.)	
<i>($n-p$)-scattering at 190 MeV neutron energy</i>	66
Kazarinov, Yu. M., and Simonov, Yu. N. (presented by Tyapkin, A. A.)	
<i>Single pion production at 0.96 BeV</i>	69
Pickup, E., Ayer, F. and Salant, E. O. (presented by Pickup, E.)	
<i>Pion interactions in hydrogen at 1.10 BeV</i>	72
Pickup, E., Robinson, D. K. and Salant, E. O. (presented by Pickup, E.)	
<i>Production of charged mesons by 245 MeV π^- mesons on hydrogen</i>	74
Batusov, Yu. A., Bunyatov, S. A., Sidorov, V. M. and Yarba, V. A. (presented by Mukhin, K.)	

<i>Production of charged mesons by 290 MeV π^--mesons on hydrogen</i>	76
Batusov, Yu. A., Bunyatov, S. A., Sidorov, V. M. and Yarba, V. A. (presented by Mukhin, K.)	
<i>Determination of the charge-exchange cross section of π-mesons into π-mesons from the analysis of the reaction $\pi^- + p \rightarrow \pi^- + \pi^+ + n$ at 290 MeV</i>	79
Batusov, Yu. A., Bunyatov, S. A., Sidorov, V. M. and Yarba, V. A. (presented by Mukhin, K.)	
<i>Inelastic (π^-, N)-interactions at the energy of 7 BeV</i>	82
Petrzilka, V.	
<i>Elastic and inelastic proton-nucleon interactions at high energies</i>	91
Part I : Azimov, S. A., Bannik, B. P., Grishin, V. G., Do In Seb, Kirillova, L. F., Markov, P. K., Nikitin, V. A., Popova, L. G., Silin, I. N., Silvestrov, L. V., Tsyganov, E. N., Shafranova, M. G., Shahbazyan, A. A., Yuldashev, A. A., Zlateva, A., Peieva, A., Khristov, L. and Chernev, Ch.	
Part II : Van Shu-feng, Visky, T., Gramenitsky, I. M., Grishin, V. G., Dalkhazav, N., Dremin, I. M., Corbel, Z., Lebedev, R. M., Maksimenko, V. M., Nomofilov, A. A., Podgoretsky, M. I., Rob, L., Streltsov, V. P., Tuvdendorge, D., Khvastunov, M. S. and Chernavsky, D. S. (presented by Veksler, V. I.)	
<i>Recent work on nucleon-nucleon scattering at Harwell</i>	100
Rose, B.	
<i>Nucleon-nucleon scattering at Harvard</i>	107
Wilson, R.	
<i>Nucleon-nucleon scattering experiments at Rochester</i>	111
England, A., Gibson, W., Gotow, K., Heer, E., Tinlot, J. and Warner, R. (presented by Tinlot, J.)	
<i>Correlation of the normal components of polarization in elastic (pp) scattering for 90° c.m.s. at 650 MeV</i>	115
Dzhelepow, V. P.	
<i>Analysis of nucleon-nucleon scattering experiments</i>	117
Noyes, H. P.	
<i>Energy dependence of p-p phase shifts</i>	128
Stapp, H. P., Moravcsik, M. J. and Noyes, H. P. (presented by Noyes, H. P.)	
<i>Nucleon-nucleon phase parameters</i>	132
Breit, G.	
<i>Phase-shift analysis of p-p scattering at 95, 150 and 310 MeV</i>	138
Tyapkin, A. A.	
<i>Two-nucleon potential with full recoil and the determination of the type of coupling between the pion and the nucleon</i>	141
Machida, S.	
<i>Polarization in proton-proton and proton-Beryllium scattering at 1.7 GeV</i>	144
van Rossum, L.	
<i>Total cross sections for p, \bar{p}, and π^\pm on hydrogen between 5 and 10.7 GeV/c</i>	149
von Dardel, G., Frisch, D. H., Mermod, R., Milburn, R. H., Piroué, P. A., Vivargent, M., Weber, G. and Winter, K. (presented by von Dardel, G.)	

<i>Recent experiments on the antinucleon-nucleon interaction</i>	151
Wenzel, W. A.	
<i>Double scattering of antiprotons in hydrogen</i>	159
Lannutti, J., Lynch, G., Maglic, B., Stevenson, M. L. and Nguyen-h-Xuong (presented by Alvarez, L.)	
<i>Antiproton experiments in a hydrogen bubble chamber</i>	164
Solmitz, F.	
<i>Pion-pion interaction and antinucleon annihilation</i>	173
Pinski, G., Sudarshan, E. C. G. and Manhantappa, K. T. (presented by Sudarshan, E. C. G.)	
<i>Production of particle beams at very high energies</i>	177
Drell, S. D.	

APPENDIX TO SESSION S 1

(Papers contributed to the Conference but not presented)

<i>Measurement of the Panofsky ratio by the method of gamma-gamma coincidences</i>	181
Dunaitsev, A. F., Pantuev, V. S., Prokoshkin, Yu. D., Tang Syao-wei and Khachaturyan, M. N.	
<i>Triple pion production at 810, 970, and 1110 MeV</i>	183
Kenney, V. P., Dardis, J. G. and Brunhart, G.	
<i>π^-p interactions at 225 MeV</i>	185
Deahl, J., Derrick, M., Fetkovich, J., Fields, T. and Yodh, G. B.	
<i>π^+p elastic scattering at 120 MeV</i>	188
Loria, A., Mittner, P., Santangelo, R., Zago, G., Brenner, A., Grard, F. and Montanet, J.	
<i>The elastic scattering of negative pions by protons at 128 and 162 MeV</i>	190
Budagov, Yu. A., Wiktor, S., Dzhelepov, V. P., Yermolov, P. F. and Moskalev, V. I.	
<i>Measurement of the total cross section for π^-p charge exchange from $T_\pi = 0.4$ GeV to $T_\pi = 1.5$ GeV</i>	191
Brisson, J. C., Falk-Vairant, P., Merlo, P., Sonderegger, P., Turlay, R. and Valladas, G.	
<i>On the complete set of experiments on the determination of the amplitude ratios of pion production in nucleon collisions with different isotopic spin states</i>	194
Marish, K. S. and Soroko, L. M.	
<i>Elastic scattering of 142 MeV negative pions by deuterons</i>	196
Pewitt, E. G., Yodh, G. B., Derrick, M., Fetkovich, J. and Fields, T.	
<i>The nucleon-nucleon repulsive core and the spin-orbit interaction</i>	198
Breit, G.	
<i>On the spin correlation coefficient C_{nn} for 310 MeV $p-p$ scattering at 90° (c.m.s.)</i>	200
Vasilevsky, I. M., Vishnyakov, V. V., Iliescu, E. I. and Tyapkin, A.A.	
<i>Proton-proton differential cross section at 1 BeV</i>	202
Dowell, J. D., Friskin, W. R., Martelli, G., Musgrave, B., van der Raay, H. B. and Rubinstein, R.	

<i>Proton-proton interactions at 2.85 BeV</i>	203
Smith, G., Courant, H., Fowler, E., Kraybill, H., Sandweiss, J. and Taft, H.	
<i>Extension of the isobaric nucleon model for pion production in π-N, N-N and \bar{N}-N collisions.</i>	205
Lindenbaum, S. J. and Sternheimer, R. M.	
 SESSION S 2 — Strong Interactions of Pions and Nucleons (Theoretical)	
<i>Many-particle structure of Green's functions</i>	211
Symanzik, K.	
<i>The use of perturbation methods in dispersion theory</i>	219
Eden, R. J.	
<i>Problems of majorization of Feynman diagrams</i>	230
Logunov, A. A.	
<i>The Mandelstam representation in perturbation theory</i>	232
Landshoff, P. V., Polkinghorne, J. C. and Taylor, J. C. (presented by Polkinghorne, J. C.)	
<i>A generalized unitarity relation</i>	236
Cutkosky, R. E.	
<i>The complex singularities of partial wave amplitudes in perturbation theory</i>	243
Taylor, J. G. and Warburton, A. E. A. (presented by Taylor, J. G.)	
<i>Unstable particles in general field theory</i>	245
Gunson, J. and Taylor, J. G. (presented by Taylor, J. G.)	
<i>Unphysical Riemann sheets</i>	247
Blankenbecler, R.	
<i>Perturbation theory without Hamiltonian</i>	254
Nishijima, K.	
<i>A new reduction technique in quantum field theory</i>	259
Toll, J. S.	
<i>The structure of the non-relativistic scattering matrix</i>	270
Newton, R. G.	
<i>Dispersion relations and the causality concept</i>	271
Lozano, J. M. and Moshinsky, M. (presented by Lozano, J. M.)	
<i>The pion-pion interaction</i>	273
Chew, G. F.	
<i>The derivations of the $\pi\pi$ and πN scattering from the Mandelstam representation</i>	278
Efremov, A. V., Meshcheryakov, V. A., Shirkov, D. V. and Hun-Yuan Tzu. (presented by Shirkov, D. V.)	
<i>Application of the Mandelstam representation to pion-nucleon scattering</i>	282
Frazer, W. R.	

<i>Dispersion relation for the s-wave partial amplitude in pion-nucleon scattering</i>	288
Hamilton, J.	
<i>The $N\bar{N}$-$\pi\pi$ amplitude</i>	292
Wong, D. Y.	
<i>Singularities of the scattering amplitude in perturbation theory</i>	296
Pitashinsky, A. Z., Rudik, A. P. and Sudakov, V. V. (presented by Rudik, A. P.)	
<i>Nearest singular points in the pion-pion scattering problem</i>	297
Kolkunov, V. A., Okun, L. B. Rudik, A. P., and Sudakov, V. V. (presented by Rudik, A. P.)	
<i>Pion production by pions and the second pion-nucleon resonance</i>	298
Goebel, C. and Schnitzer, H. J. (presented by Goebel, C.)	
<i>Determination of the renormalized π-N coupling constant</i>	302
Woolcock, W. S. (presented by Hamilton, J.)	
<i>Double dispersion approach to nucleon-nucleon scattering</i>	304
MacDowell, S. W.	
<i>One dimensional representation for low energy pion phenomena</i>	310
Cini, M. and Fubini, S. (presented by Cini, M.)	
<i>Theory of low energy nucleon-nucleon scattering</i>	319
Amati, D., Leader, E. and Vitale, B. (presented by Amati, D.)	
<i>Relativistic dispersion approach to pion photoproduction near threshold</i>	325
Baldin, A. M.	
<i>On the asymptotic behavior of cross sections at high energies</i>	333
Berestetsky, V. B. and Pomeranchuk, I. Ya. (presented by Rudik, A.)	
<i>On the asymptotic behavior of scattering amplitudes at high energies</i>	340
Gribov, V. N. (presented by Rudik, A.)	
<i>Single virtual boson exchange effects in high energy collisions</i>	348
Salzman, G.	

APPENDIX TO SESSION S 2

(Papers contributed to the Conference but not presented)

<i>Two particle singularities of the scattering amplitude</i>	351
Zimmermann, W.	
<i>On the pion-pion interaction</i>	353
Taylor, J. G.	
<i>On the p-wave resonance and the unphysical region in pion-pion scattering</i>	355
Moffat, J. W.	
<i>$\pi\pi$ interactions in πN collisions at high pion energies</i>	357
Blokhintsev, D. I. and Wang Yung	

<i>Mandelstam representation for the non-relativistic many channel problem</i>	358
Fonda, L., Radicati, L. A. and Regge, T.	
<i>Calculation of pion-nucleon scattering phase shifts from dispersion relations</i>	359
Höhler, G. and Dietz, K.	
<i>The D-wave dispersion relations for πN scattering in a model of pion theory</i>	361
Królikowski, W.	
<i>S-wave meson-nucleon interaction and nucleon core</i>	
Minami, S.	363
<i>The theory of the second resonance in the pion-nucleon scattering</i>	364
Itabashi, K., Kato, M., Nakagawa, K. and Takeda, G.	
<i>Photoproduction of pions on pions</i>	366
Soloviev, L. D.	
 SESSION S 3 — Strong Interactions of Strange Particles	
<i>Photoproduction of strange particles</i>	369
Turkot, F.	
<i>Production of strange particles in p-p collisions at 2.85 BeV</i>	372
Louttit, R. I., Morris, T. W., Rahm, D. C., Rau, R. R. Thorndike, A. M. and Willis, W. J. (presented by Rau, R. R.)	
<i>Σ^- production near threshold</i>	377
Alston, M. H., Anderson, J. A., Burke, P. G., Carmony, D. D., Crawford, F. S., Schmitz, N. and Wolf, S. E. (presented by Solmitz, F.)	
<i>Detection of a cusp in $\Lambda^0 K^0$ production at ΣK threshold</i>	378
Alston, M. H., Anderson, J. A., Burke, P. G., Carmony, D. D., Crawford, F. S., Schmitz, N. and Wolf, S. E. (presented by Solmitz, F.)	
<i>The cross section ratio $\eta = \frac{\sigma(K^0, \bar{K}^0)}{(\sigma(\Lambda, K^0) + \sigma(\Sigma^0, K^0))}$ for strange particles produced by 2.8 BeV/c π^--mesons on xenon nuclei</i>	382
Kuznetsov, E. V., Ivanovskaya, I. A., Prokesh, A. and Chuvilo, I. V. (presented by Chuvilo, I. V.)	
<i>Transverse polarization of Λ^0-hyperons produced by 2.8 BeV/c π^--mesons on xenon nuclei</i>	383
Kuznetsov, E. V., Ivanovskaya, I. A., Prokesh, A. and Chuvilo, I. V. (presented by Chuvilo, I. V.)	
<i>On parity conservation in Λ-hyperon production</i>	384
Kuznetsov, E. V., Ivanovskaya, I. A., Prokesh, A. and Chuvilo, I. V. (presented by Chuvilo, I. V.)	
<i>Strange particle production in πp-collisions at 7-8 BeV</i>	388
Soloviev, M. I.	
<i>Strange particle production in 16 GeV $\pi^- p$ interactions</i>	402
Bartke, J., Bock, R., Budde, R., Cooper, W. A., Filthuth, H., Goldschmidt-Clermont, Y., Grard, F., MacLeod, G. R., Minguzzi-Ranzi, A., Montanet, L., Moorhead, W. G., Morrison, D. R. O., Peyrou, C., Powell, B. W., Trembley, J., Wiskott, D., Bertanza, I., Franzinetti, C., Mannelli, I., Silvestrini, V., Brautti, G., Ceschia, M. and Chersovani, L. (presented by Peyrou, C.)	

<i>Investigation at 1.15 GeV/c of the associated production $\pi^+ + p \rightarrow \Sigma^+ + K^+$</i>	406
Berthelot, A., Daudin, A., Goussu, O., Grard, F., Jabiol, M.-A., Levy, F., Lewin, C., Rogozinski, A., Laberrigue-Frolow, J., Ouannes, C. and Vigneron, L. (presented by Berthelot, A.)	
<i>K^- capture process and K^- nuclear interactions</i>	407
Snow, G. A.	
<i>K^- interactions in deuterium</i>	415
Dahl, O., Horwitz, N., Miller, D., Murray, J. and Watson, M. (presented by Miller, D.)	
<i>Hyperfragment formation in $K^- + He^4$ captures at rest and $K\Lambda$ relative parity</i>	419
The helium bubble chamber collaboration group : Block, M. M., Brucker, E. B., Chang, C. C., Gessaroli, R., Kikuchi, J., Kovacs, A., Meltzer, C. M., Pevsner, A., Schlein, P., Strand, R., Cohn, H. O., Harth, E. M., Leitner, J., Monari, L., Lendinara, L. and Puppi, G. (presented by Puppi, G.)	
<i>The $\Sigma\Lambda$ conversion process in K^--He absorption</i>	423
The helium bubble chamber collaboration group (presented by Leitner, J.)	
<i>K^- interactions at rest in helium</i>	426
The helium bubble chamber collaboration group (presented by Block, M.)	
<i>On the multi-nucleon capture of K^--mesons</i>	432
Alexander, G., Eisenberg, Y., Friedman, M. and Kessler, D. (presented by Eisenberg, Y.)	
<i>Some evidence for fast Σ hyperon production by K^- meson interactions with light nuclei in emulsion</i>	435
Evans, D., Jones, B. D., Sanjeevaiah, B., Zakrzewski, J. and Davis, D. H. (presented by Fowler, P. H.)	
<i>Emulsion work on strange particles</i>	436
Bologna-Munich-Parma Collaboration and Munich-Turin Collaboration (presented by Gottstein, K.)	
<i>Total cross section for π^--p interaction at high energy</i>	443
Vovenko, A. S., Kulakov, B. A., Lubimov, A. L., Matulenko, Y. A., Savin, I. A., Smirnov, E. V. and Shafranov, M. D. (presented by Chuvilo, I. V.)	
<i>Total cross sections for high energy K^+-mesons and π^+-mesons</i>	444
Chzan Nai-sen, Sui Yuin-chan, Lykhachev, M. F. and Stavinsky, V. S. (presented by Chuvilo, I. V.)	
<i>K^- interactions at 1.15 BeV/c in the 15 inch hydrogen bubble chamber</i>	445
Alston, M., Alvarez, L. W., Eberhard, P., Good, M. L., Graziano, W., Ticho, H. K. and Wojcicki, S. (presented by Good, M. L.)	
<i>Status report on the K^+d and K^+p scattering experiment</i>	451
Chinowsky, W., Goldhaber, G., Goldhaber, S., Lee, W., O'Halloran, T., Stubbs, T., Slater, W. E., Stork, D. H. and Ticho, H. K. (presented by Ticho, H. K.)	
<i>The K^- proton and neutron interaction from 0.6 BeV to 3.5 BeV</i>	456
Cook, V., Cork, B., Hoang, T. F., Keefe, D., Kerth, L. T., Wenzel, W. A. and Zipf, T. F. (presented by Kerth, L. T.)	
<i>Parity conservation and symmetry laws in strong interactions</i>	458
Dallaporta, N.	
<i>Remarks concerning the low energy K-nucleon interaction</i>	467
Bjorken, J. D.	

<i>Effect of pion-pion resonance in K^+p scattering</i>	473
Lee, B. W., (presented by Klein, A.)	
<i>Possible effect of \bar{K}-N reactions on K-N scattering</i>	476
Capps, R. H.	
<i>Remark on the absence of a resonance in K^+p scattering</i>	477
Królikowski, W.	

APPENDIX TO SESSION S 3

(Papers contributed to the Conference but not presented)

<i>The reaction $\bar{p} + p \rightarrow \bar{\Lambda} + \Lambda$</i>	481
Button, J., Eberhard, P., Kalbfleisch, G. R., Lannutti, J., Lynch, G. R., Maglic, B. C., Stevenson, M. L. and Nguyen-h-Xuong	
<i>Total cross section for $K+p$ between 3 and 8 GeV/c</i>	484
von Dardel, G., Frisch, D. H., Mermod, R., Milburn, R. H., Piroué, P. A., Vivargent, M., Weber, G. and Winter, K.	
<i>A search for $S = -2$ negative heavy meson in nuclear emulsions</i>	485
Eisenberg, Y., Friedman, M., Alexander, G. and Kessler, D.	
<i>The binding energy of the hypertriton</i>	486
Abou-Hadid, L. and Higgins, K.	
<i>K^- interaction at 1.1 BeV/c</i>	487
Baldo-Ceolin, M., Caforio, A., Farini, F., Ferilli, F. and Miari, G.	
<i>Interactions of 1.15 GeV/c K^- in emulsion</i>	489
Garelli, C. M., Quassiat, B. and Vigone, M.	
<i>Remarks on the K^- and Σ interactions and the question of global symmetry</i>	490
Eisenberg, Y. and Kessler, D.	
<i>Measurement of the sign of the real part of the potential for K^--nuclear scattering</i>	493
Hill, R. D., Hetherington, J. H. and Ravenhall, D. G.	
<i>Hypernuclei produced by K^- interactions in nuclear emulsions: general characteristics and non-mesic decays</i>	494
Gorgé, V., Koch, W., Lindt, W., Nikolić, M., Subotić-Nikolić, S. and Winzeler, H.	
<i>Search for Σ^--hyperfragments</i>	497
Ammar, R. G., Crayton, N., Jain, K. P., Levi-Setti, R., Mott, J. E., Schlein, P. E., Shrivastava, P. K. and Skjeggestad, O.	

SESSION S 4 — Weak Interactions

<i>The status of the conserved vector current hypothesis</i>	501
Feynman, R. P.	
<i>Conserved and partially conserved currents in the theory of weak interactions</i>	508
Gell-Mann, M.	

<i>Application of dispersion relations to weak interactions</i>	513
Khuri, N. N.	
<i>Outline of a dispersion theory of three-particle decays of real and virtual particles</i>	523
Bonnevay, G. (presented by Castillejo, L.)	
<i>Pion-pion effects in τ-decay</i>	525
Mitra, A. N.	
<i>The pion-pion interaction in τ-decay</i>	526
Lomon, E.	
<i>The muon absorption interaction</i>	529
Wolfenstein, L.	
<i>Measurement of μ-meson helicity</i>	539
Alikanov, A. T., Galaktionov, Tu. V., Gorodkov, Yu. V., Elishev, G. P. and Lyubimov, V. A. (presented by Lyubimov, V. A.)	
<i>A determination of the lifetime of the μ^+ meson</i>	542
Astbury, A., Hattersley, P. M., Hussain, M., Kemp, A. and Muirhead, H. (presented by Muirhead, H.)	
<i>High energy gamma-rays from muon capture</i>	544
Keuffel, J. W.	
<i>The Auger rate in μ-mesic atoms</i>	547
Pevsner, A., Madansky, L., Strand, R. and Toohig, T. (presented by Pevsner, A.)	
<i>On the intensity of radiationless transitions in the μ-mesic atoms of Pb, Bi, Th, U^{235}, U^{238}</i>	550
Mukhin, A. I., Balatz, M. J., Kondratiev, L. N., Landsberg, L. G., Lebedev, P. I., Obukhov, Yu. V. and Pontecorvo, B. (presented by Mukhin, A. I.)	
<i>The q-value for the β-decay of the negative muon</i>	553
Block, M. M., Fiorini, E., Kikuchi, T., Giacomelli, G. and Ratti, S. (presented by Block, M. M.)	
<i>Search for neutrinoless conversion of muon into electron</i>	557
Sard, R. D., Crowe, K. M. and Kruger, H. (presented by Sard, R. D.)	
<i>The limit of applicability of the theory of weak interactions</i>	561
Ioffe, B. L. (presented by Rudik, A.)	
<i>Electromagnetic properties of a charged vector meson intermediary in weak interactions</i>	564
Bludman, S. A. and Young, J. A. (presented by Bludman, S. A.)	
<i>Intermediate boson hypothesis of weak interactions</i>	567
Lee, T. D.	
<i>On the structure and parity of weak interaction currents</i>	572
Gürsey, F.	
<i>On high energy neutrino physics</i>	578
Markov, M. A.	
<i>The program of "neutrino experiments" at CERN</i>	581
Bernardini, G.	

<i>Consistency between the $\Delta T = \frac{1}{2}$ rule and the low rate of $K^+ \rightarrow \pi^+ + \pi^0 + \gamma$ as compared to $K^+ \rightarrow \pi^+ + \pi^0$</i>	586
Gatto, R.	
<i>$\Delta S = 1, \Delta I = \frac{1}{2}$ rules with charged intermediate bosons only</i>	589
d'Espagnat, B.	
<i>Asymmetry in the pionic decay modes of Λ and Σ hyperons</i>	590
Cronin, J. W.	
<i>Measurement of the branching ratios of K_1^0 and Λ^0</i>	594
Baglin, C., Bloch, M., Brisson, V., Hennessy, J., Lagarrigue, A., Mittner, P., Musset, P., Orkin-Lecourtois, A., Rançon, P., Rousset, A., Saruis, A. M., Sauteron, X. and Six, J. (presented by Lagarrigue, A.)	
<i>Lifetime estimates for the hypernuclei ${}_A^4H$, ${}_A^4He$ and ${}_A^3H$</i>	595
The helium bubble chamber collaboration group : Block, M., Brucker, E., Cohn, H., Chang, C., Gessaroli, R., Harth, E., Kikuchi, T., Kovacs, A., Leitner, J., Meltzer, C., Monari, L., Pevsner, A., Puppi, G., Schlein, P. and Strand, R. (presented by Pevsner, A.)	
<i>Regeneration of neutral K mesons and their mass difference</i>	597
Muller, F., Birge, R. W., Fowler, W. B., Good, R. H., Hirsch, W., Matsen, R. P., Oswald, L., Powell, W. M., White, H. S. and Piccioni, O. (presented by Piccioni, O.)	
<i>The K_1^0-K_2^0 mass difference</i>	601
Birge, R. W., Ely, R. P., Powell, W. M., Huzita, H., Fry, W. F., Gaides, J. A., Natali, V., Willman, R. B. and Camerini, U. (presented by Camerini, U.)	
<i>On the decay properties of K_2^0 mesons</i>	603
Neagu, D., Okonov, E. O., Petrov, N. I., Rosanova, A. M. and Rusakov, V. A. (presented by Chuvilo, I. V.)	
<i>The non-leptonic decay modes of the hyperons</i>	604
Feldman, G., Matthews, P. T. and Salam, A. (presented by Feldman, G.)	
<i>On the e-μ relative lepticity</i>	606
Prieto, F. E. and de Oyarzabal, J. (presented by Prieto, F. E.)	
<i>Mesic decay of hyperfragments</i>	607
Iwao, S. and Sudarshan, E. C. G. (presented by Sudarshan, E. C. G.)	
<i>Possible formal symmetry between muon and electron</i>	609
Gatto, R.	

APPENDIX TO SESSION S 4

(Papers contributed to the Conference but not presented)

<i>Investigation of μ-mesic atom paramagnetism</i>	611
Egorov, L. B., Zhuravlev, G. V., Ignatenko, A. E., Li Syang-ming, Petrashku, M. G. and Chultem, D.	
<i>Shell model calculations of the hyperfine splitting effect in the capture of μ mesons</i>	612
Überall, H.	
<i>Neutral decay modes of Λ^0 and K^0</i>	613
Brown, J. L., Bryant, H. C., Burnstein, R. A., Glaser, D. A., Hartung, R. W., Kadyk, J. A., Sinclair, D., Trilling, G. H., Vander Velde, J. C. and Van Putten, J. D.	

<i>Angular distribution of the $\mu^+ \rightarrow e^+$ decay electrons in strong magnetic fields</i>	614
Nikolsky, B. A. and Ali-Zade, S. A.	
<i>Experiments with neutrinos emitted by mesons</i>	617
Pontecorvo, B.	
<i>Search for a second π^0</i>	619
Selove, W. and Gettner, M.	
SESSION R 1 — Strong Interactions of Pions and Nucleons I (photoproduction, pion scattering, pion production)	
<i>Experimental information on the strong interactions of pions and nucleons (photoproduction, pion scattering, pion production)</i>	623
Ashkin, J.	
<i>Review of recent developments in the application of dispersion theory</i>	642
Wick, G. C.	
SESSION R 2 — Strong Interactions of Pions and Nucleons II (nucleon and antinucleon processes)	
<i>Nucleon-nucleon and nucleon-antinucleon interactions (experimental)</i>	653
Chamberlain, O.	
<i>Nucleon and antinucleon processes (theoretical)</i>	663
Lévy, M.	
<i>General analytic techniques</i>	675
Symanzik, K.	
SESSION R 3 — Strong Interactions of Strange Particles	
<i>The strong interaction of strange particles (experimental)</i>	685
Schwartz, M.	
<i>K-meson interactions (experimental)</i>	693
Miller, D.	
<i>Strong interaction of strange particles (theoretical)</i>	700
Matthews, P. T.	
SESSION R 4 — Weak Interactions	
<i>The experimental status of the weak interactions of non-strange particles</i>	713
Telegdi, V. L.	
<i>Weak interactions of strange particles (experimental)</i>	726
Schwartz, M.	
<i>Weak interactions (theoretical)</i>	732
Goldberger, M. L.	

APPENDIX TO SESSION R 4

Certain problems of weak interaction theory
Okun, L. B.

743

SESSION P 1 — Structure of Elementary Particles

<i>Scattering of electrons by protons</i>	757
Berkelman, K., Cassels, J. M., Olson, D. N. and Wilson, R. R. (presented by Wilson, R. R.)	
<i>Splitting of the proton form factors and diffraction in the proton</i>	762
Hofstadter, R., Bumiller, F. and Croissiaux, M. (presented by Hofstadter, R.)	
<i>Some speculative remarks on the Dirac and Pauli form factors of the neutron</i>	767
Herman, R. and Hofstadter, R. (presented by Hofstadter, R.)	
<i>Progress report on e-e colliding beams experiment</i>	769
Panofsky, W. K. H.	
<i>e-e colliding beam experiment (theoretical)</i>	771
Yung-Su Tsai	
<i>Electromagnetic structure of the pion</i>	775
Chew, G. F.	
<i>The anomalous magnetic moment of the muon</i>	778
Charpak, G.C., Farley, F. J. M., Garwin, R. L., Muller, T., Sens, J. C., Telegdi, V. L., York, C. M. and Zichichi, A. (presented by York, C. M.)	
<i>Muon mass and charge by critical absorption of mesic X-rays</i>	785
Devons, S., Gidal, G., Lederman, L. M. and Shapiro, G. (presented by Lederman, L. M.)	
<i>Gyromagnetic ratio of free protons at 150 MeV</i>	787
Rose, R.	
<i>Formation of muonium and observation of its Larmor precession</i>	789
Hughes, V. W., McColm, D. W., Ziock, K. and Prepost, R. (presented by Hughes, V. W.)	
<i>Experimental limits for the electron-proton charge difference and for the neutron charge</i>	790
Zorn, J. C., Chamberlain, G. E. and Hughes, V. W. (presented by Hughes, V.W.)	
<i>High energy muon scattering</i>	793
Heggie, D., Kim, Y., Masek, G. and Williams, R. (presented by Masek, G.)	
<i>Elastic scattering of μ^+ in nuclear emulsion</i>	796
Connolly, P., McEwen, J. G. and Orear, J. (presented by Orear, J.)	

SESSION P 2 — New Results at Superhigh Energies

<i>Progress report on work with the 25 GeV proton synchrotron</i>	799
Cocconi, G.	

<i>Particles produced by 24 BeV protons</i>	808
Gilly, L., Leontic, B., Lundby, A., Meunier, R., Stroot, J. P. and Szeptycka, M. (presented by Lundby, A.)	
<i>Remarks on high energy interactions</i>	810
Veksler, V. I.	
<i>Status report of international cooperative emulsion flight project on high energies</i>	812
Koshiba, M.	
<i>Angular distribution of high energy jets</i>	816
Gierula, J.	
<i>On the angular distribution of shower particles according to the excited nucleon model of meson production</i>	818
Yekutieli, G. and Maor, U. (presented by Yekutieli, G.)	
<i>Study of nucleon-nucleon interactions at hundreds of BeV</i>	819
Dobrotin, N. A. and Slavatinsky, S. A. (presented by Dobrotin, N. A.)	
<i>γ-rays from very high energy interactions</i>	829
Ali, H., Duthie, J., Kaddoura, A., Perkins, D. H., and Fowler, P. H. (presented by Fowler, P. H.)	

APPENDIX TO SESSION P 2

<i>Particle abundances in interactions with 25 GeV protons</i>	837
von Dardel, G., Mermod, R. M., Weber, G. and Winter, K.	
<i>Pion cloud effects in high energy meson production</i>	840
Friedlaender, E.	

SESSION P 3 — Theories of Elementary Particles

<i>Composite model of elementary particles</i>	843
Ohnuki, Y.	
<i>Recent research on the non-linear spinor theory of elementary particles</i>	851
Heisenberg, W.	
<i>Dynamical theory of elementary particles suggested by superconductivity</i>	858
Nambu, Y.	
<i>New functional methods in field theory</i>	867
Blokhintsev, D. I.	

APPENDIX TO SESSION P 3

<i>On the application of the methods of the superconductivity theory to the problem of the masses of elementary particles</i>	873
Vaks, V. G. and Larkin, A. I.	
<i>The electrodynamics of a zero mass spinor particle</i>	874
Vaks, V. G.	

<i>An example of a field theory with non-orthodox metric in Hilbert space</i>	874
Markov, M. A.	
Masses and mean lives of elementary particles	877
Rosenfeld, A. H. and Barkas, W.	
List of participants	881
Name index	887