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The DESY High-Energy Physics Information System

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A mechanized information system developed at DESY is discussed. 10 000 publications per year dealing with elementary particle physics are indexed and keypunched for computer processing. Preprints and reports are covered as well as the conventional literature.

Printouts are produced comprising author, subject and report number indexes. The printouts are offset reproduced and published by ZAED, Karlsruhe, as the fortnightly HIGH ENERGY PHYSICS INDEX.

The processed material is stored on magnetic tapes or disks for retrieval. Queries can be posed for title words, authors, keywords, or other aspects.

Since 1963, the Deutsches Elektronen-Synchrotron DESY in Hamburg has been producing the master printouts for the periodical HIGH ENERGY PHYSICS INDEX published by Zentralstelle für Atomkernenergie-Dokumentation (ZAED), Karlsruhe.

The reasons for its publication were the following:

1. In the field of elementary particle physics the preprint is an established and important means of scientific communication. Up to 1963 there was no indexing or abstracting periodical which included both the conventional literature and preprints and reports.
2. Speedy information on new scientific results is believed to be of great importance by the scientists working in the field of high energy physics; the desire for fast information, by the way, is the reason for the extreme importance of the preprint in this field. By using a mechanized method of producing the masters for printing it was possible to drastically reduce the time lag between acceptance deadline and printout production.

3. The HEP INDEX also serves as a catalog for the preprints and reports available in the DESY Library.

HIGH ENERGY PHYSICS INDEX appears every two weeks. Each number contains a bibliographic part with 300 to 400 references to new papers and with an index part comprising author, report number and subject indexes. There are also cumulative annual indexes.

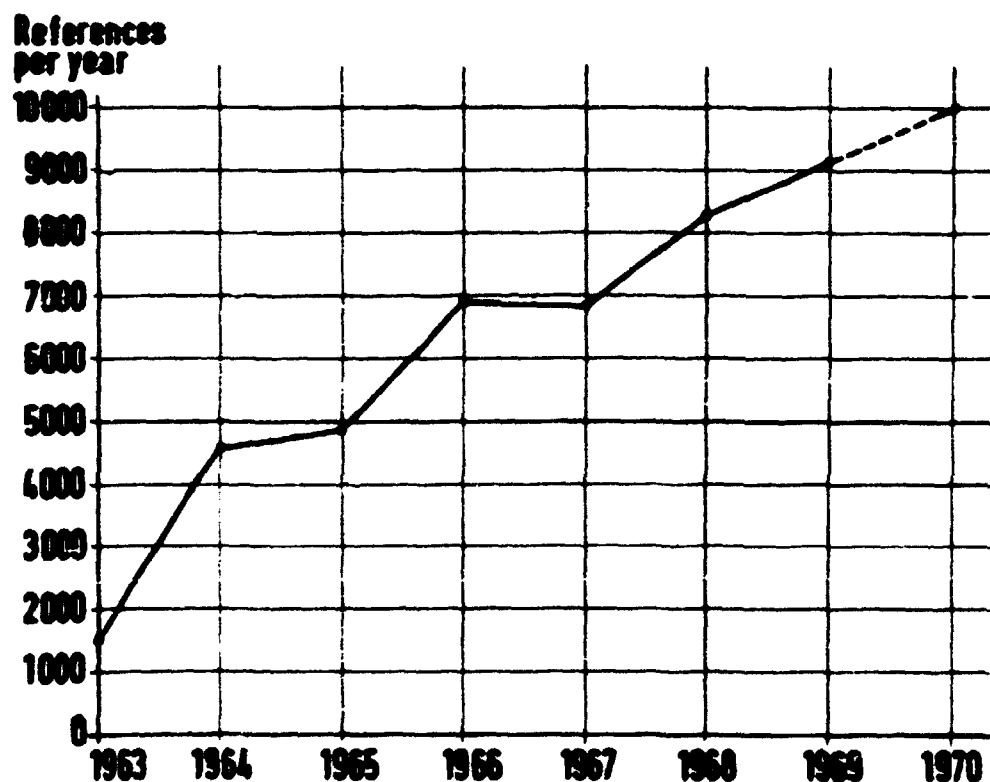


Fig. 1

The annual number of classified papers increased from 1500 in 1963 to 9000 in 1969 and is expected to reach 10000 by 1970 [Fig. 1]. A total of 42000 references has been processed so far. A retrieval system based on this material has been developed and tested in the last months.

Classification System

There are some 500 keywords, plus another 1352 two-particle interaction keywords formed by combinations of 52 types of elementary particles (example: *ELECTRON NUCLEON*). The indexer can specify any keyword more closely by an arbitrary second term separated from the proper keyword by a comma and a space (example: *SPARK CHAMBER, WIRE*). It is also possible to combine two keywords in the same manner (example: *MUON, PHOTOPRODUCTION*). Any such combination points to a close connection between the two terms and thus gives a finer subdivision than would be

				1	C	1835	10	INVESTIGATION OF THE ELECTROMAGNETIC STRUCTURE OF THE π^+ MESON USING THE
					C	1835	11	THEP (INSTITUTE OF HIGH ENERGY PHYSICS) ACCELERATOR.
	FOLGE				C	1835	20	BARDIN VU D, CZYZEMSKI O, DORRONSLSKI T, FILIPPOV P I, GUZIK Z,
					C	1835	20	BARDIN VU D, CZYZEMSKI O, DORRONSLSKI T, FILIPPOV P I, GUZIK Z,
					C	1835	21	KNAPIK YU, KJLAKOV B A, LEISTE R, NICZYPORUK B, NICHANOV T S,
					C	1835	22	SEMIKOZ V B, SHUMYKO N M, TSYGANOV E N, TURALA M, VALA K, ZELINSKI P,
					C	1835	30	OURNA JINK - E-1-4786 (69, REC. JAN 70) 19 P.
					C	1835	40	ELECTRON π^+ , ELASTIC SCATTERING
					C	1835	41	π^+ , FORM FACTOR
1. SCHLW	TEXT				C	1835	42	π^+ , DIFFERENTIAL CROSS SECTION
		SP /2	WEGGEL		M	1835	43	COUNTERS AND DETECTORS, EXPERIMENTAL RESULTS
		KNIMM	WEGGEL		C	1835	44	SHOWER COUNTER
					C	1835	45	SPARK CHAMBER
	FOLGE							
		SP1			7	Z	1843	10 RENORMALIZATION THEORY. (IN FRENCH)
						Z	1843	20 HEPP K, ZUERICH EIDGEN TECH HOCHSCH,
		KNIMM	WEGGEL			Z	1843	30 BERLIN 1969, 215 P.
						Z	1843	
						Z	1843	40 BOOK
						Z	1843	41 LECTURES
						Z	1843	42 RENORMALIZATION
						Z	1843	43 PERTURBATION THEORY
						Z	1843	44 MODEL, FIELD THEORY
						Z	1843	45 BIBLIOGRAPHY
	FOLGE							
					2	U	1851	10 PROTON-PROTON BREMSSTRAHLUNG CALCULATIONS.
						U	1851	20 MARKER D, SIGNELL P, MICHIGAN STATE UNIV,
						U	1851	30 PHYS. REV. 185 (1969) 1286-1294 AND
					1	U	1851	31 MICHIGAN STATE UNIV - CON-1051-25 (69, REC. MAY) 32 P.
						U	1851	40 P P, INTERACTION
						U	1851	41 FINAL STATE
1. SCHLW						U	1851	42 2P, PHOTON
						U	1851	43 /P, FINAL STATE
						U	1851	44 /PHOTON, FINAL STATE
						U	1851	45 BREMSSTRAHLUNG
						U	1851	46 P, CROSS SECTION
2. SCHLW						U	1851	47 POTENTIAL, HAMADA-JOHNSTON
2. SCHLW						U	1851	48 POTENTIAL, BRYAN-SCOTT
2. SCHLW						U	1851	49 POTENTIAL, TABAKIN
					2	U	1852	10 ANALYSIS OF THICK-TARGET RECOIL STUDIES OF HIGH-ENERGY NUCLEAR
	FOLGE					U	1951	50 CALCULATIONS
						U	1851	70 P P $\rightarrow$ 2P PHOTON
	FOLGE							
						U	1852	11 REACTIONS.
						U	1852	20 PORILE N T, PURDUE UNIV LAFAYETTE,

Fig.2 Correction List

permitted by the keyword list alone. A disadvantage is the necessity for repeating some keywords several times.

In the subject index a combination of keywords appears twice (example: *MUON*, *PHOTOPRODUCTION* and *PHOTOPRODUCTION*, *MUON*) while combinations of keywords with non-keywords occur only once, the keywords appearing first. The interaction of two elementary particles is treated in a special manner (example, bibliographical part: *PI- P*, *INTERACTION * FINAL STATE: N*, *PI+*, *PI-*; in the subject index the same reaction appears under the following headings: (1) *PI- P*, *INTERACTION*; (2) *N*, *FINAL STATE*; (3) *PI+*, *FINAL STATE*; (4) *PI-*, *FINAL STATE*. A new method for classifying particle reactions will be applied later in 1970.

Our keyword vocabulary has been developed and annually revised during the whole period of publication. Lists giving the translation of frequently occurring terms into standardized combinations have been compiled to ensure consistency in keyword assignment, which is also checked by a second scientist.

Keyword Assignment and Data Input

Papers eligible for inclusion in the HIGH ENERGY PHYSICS INDEX are selected from the printed material received at DESY. The preprints which have in the meantime appeared as papers in periodicals are located with the help of the retrieval system. They are mentioned in the new reference together with the regular publication source.

The papers are analyzed by a scientist. Approximately 10 keywords are assigned per paper, and 40 references are classified per man-day.

On the basis of the original papers and the assigned keywords the title, author(s), source(s) and keywords are typed and keypunched on an IBM 826 typewriter-keypunch combination. A scientist proofreads and compares the typed text with the original.

In weekly intervals, the punchcards are fed into an IBM/360 computer model 75 operated in the MVT mode. The programs are written in the IBM/360 Assembler language. In the correction list [Fig.2] every line represents a punchcard. Column 1 contains a code indicating whether the paper is a regular publication or a preprint; Column 2 contains a code indicating one of the 14 topical fields in which the paper appears in the bibliographical part of the HEP INDEX [Fig.3]. Columns 3-8 give the publication number

<u>Experimental Physics</u>	
General.....	609
General Reactions, Weak Interactions.....	610
(see also Strange Particles)	
Electromagnetic Interactions.....	611
(see also Strange Particles, General Reactions)	
Strong Interactions.....	612
(see also Strange Particles, General Reactions)	
Strange Particles.....	613
Accelerators.....	614
Methods and Instruments.....	616
<u>Theoretical Physics</u>	
General.....	618
General Reactions, Weak Interactions.....	620
(see also Strange Particles)	
Electromagnetic Interactions.....	621
(see also Strange Particles, General Reactions)	
Strong Interactions.....	623
(see also Strange Particles, General Reactions)	
Strange Particles.....	626
Symmetry Principles.....	628
Field Theory.....	629
Author Index.....	A 1
Preprint and Report Number Index.....	A 5
Subject Index.....	A 7

Fig.3 Table of contents of HEP INDEX showing
14 topical fields in bibliographical part

and the category of the text (title, author, source, or keywords). In the correction list [Fig.2] comments are given on formal errors; for instance, all keywords and institutes issuing reports are mechanically compared with authoritative lists stored on magnetic disks. The error remarks are given on the left side of the printout. The records are sorted and then written on magnetic tape. The tape is the input for the second step. At this point corrections can be inserted and new records added. Correction lists are printed after every step.

Production of the Master Printout

The most recent magnetic tape serves as the input for the master printout program. The material is sorted into the fourteen topical fields [Fig.3]. A sample page of the bibliographical part is shown in Fig.4.

- EXPERIMENTAL - STRANGE PARTICLES -

- 109
INTERACTION OF KIONS WITH NUCLEI.
FRETTER W F, CALIF UNIV - BERKELEY.
PREPRINT - FRETTER W F (69,REC,DEC) 18 P.
KEYWORDS: K- NUCLEUS, INTERACTION • TRACK DATA ANALYSIS
• K-, TOTAL CROSS SECTION • K-, DIFFERENTIAL CROSS
SECTION • BUBBLE CHAMBER(HEAVY LIQUID), EXPERIMENTAL
RESULTS •
- 109
HYPERNUCLEI.
PNIENSKI J, WARSAW INST NUCLEAR RESEARCH.
PREPRINT - PNIENSKI J (69,REC,DEC) 65 P.
KEYWORDS: HYPERFRAGMENT • LAMBDA, BINDING ENERGY •
LAMBDA NUCLEUS, INTERACTION • NUCLEAR PROPERTIES •
FINAL-STATE INTERACTION • LECTURES • REVIEW •
BIBLIOGRAPHY •
- 110
K⁺ HYPERON PRODUCTION IN P⁺-P INTERACTIONS AT 5.1 GEV/C.
(IN RUSSIAN)
BUDAGOV YU A, VINOGRADOV V B, VOLKOV A G, DZHELEPOV V P,
DUSHENKO V F, KLDNITSKY V S, LOMAKIN YU F, MARTINSKA G,
FLYAGIN V M, SHLYAPNIKOV P V,
DURNA JINR - P-1-4794 (69,REC,DEC) 6 P.
KEYWORDS: P⁺-P, INTERACTION • FINAL STATES: 3 K⁺-2K⁰
P⁺ - K⁺-K⁰ K⁺ P⁺ • K⁺-K⁰ K⁺ • TOTAL CROSS SECTION •
K⁺-, DECAY • FINAL STATES: LAMBDA P⁺ • BUBBLE
CHAMBER(HYDROGEN), EXPERIMENTAL RESULTS •
- 111
FORM FACTORS IN THE DECAY K⁺ → P⁺ LEPTON+ NEUTRINO.
MATTERILL D R, BROWN R M, CLEGG A B, CORBETT I F, CULLIGAN
G, EMERSON J M, FIELD R C, GARVEY J, JONES P R, MIDDLEMAS
M, NEWTON D, QUIRK T W, SALMON G L, STEINBERG P M,
WILLIAMS W S C, OXFORD UNIV.
CHILTON RUTHERFORD LAB - RPP/H/62 (RFC,JAN 70) 11 P.
KEYWORDS: K⁺, LEPTONIC DECAY • FINAL STATES: P⁺,
LEPTON, NEUTRINO • P⁺, ENERGY SPECTRUM • FORM FACTOR •
MOMENTUM, SPECTRA • SPARK CHAMBER, EXPERIMENTAL RESULTS
•
- 112
EVIDENCE FOR THE EXISTENCE OF A Z⁰.
KATZ S, KOEHLER P, NOVEY T, YOKOSAWA A, BURLISON G,
NORTHWESTERN UNIV EVANSTON,
ARGONNE NATIONAL LAB - ANL/MEP-6926 (69,REC,JAN 70) 32 P.
KEYWORDS: K⁺ P, ELASTIC SCATTERING • PARTIAL-WAVE
ANALYSIS • K⁺, DIFFERENTIAL CROSS SECTION • P,
POLARIZATION • NEW PARTICLE, Z⁰ • BARYON RESONANCE, Z⁰ •
INTERPRETATION OF EXPERIMENTS •
- 113
EVIDENCE AGAINST A¹ PRODUCTION IN HIGH ENERGY K⁺ P
INTERACTIONS.
RABIN M S, BARRARD-GALLIERT A, DERENZO S E, FLATTE S M,
FRIEDMAN J M, GARNJOST M A, SCHMITZ F T, UVEDA N M,
WINDHOLDERS R,
CALIF UNIV - UCRL-19362 (69,REC,DEC) 16 P.
KEYWORDS: K⁺ P, INTERACTION • FINAL STATES: K⁺, P, 3
PIONS - K⁺, P, 4 PIONS • A¹(1070) • BUBBLE
CHAMBER(HYDROGEN), EXPERIMENTAL RESULTS •
- 114
A MEASUREMENT OF THE BRANCHING RATIO K⁺ → 2P⁺/(K⁺ → 3P⁺).
OLIVER W P,
CALIF UNIV - UCRL-19397 (69,REC,JAN 70) 57 P.
KEYWORDS: K⁺, DECAY MODES • FINAL STATES: 2 P⁺ - 3 P⁺
• VIOLATION, CP • SPARK CHAMBER • SHOWER COUNTER •
COUNTERS AND DETECTORS, EXPERIMENTAL RESULTS •
- 115
INVESTIGATION OF THE MASS SPECTRUM OF LAMBDA K-SYSTEM IN
P⁺-P INTERACTIONS AT 4 AND 5.1 GEV/C. (IN RUSSIAN)
BUDAGOV YU A, VINOGRADOV V B, VOLKOV A G, DZHELEPOV V P,
KIRILLOV-UGRYUMOV V G, KLDNITSKY V S, KUZNETSOV A A,
LOMAKIN YU F, MELNIKOVA N A, PONOSOV A K, FLYAGIN V B,
SHLYAPNIKOV P V, MARTINSKA G, BALINT V, MIHUL A, MUMUSIANU
D, PONTA G, FLEA S, CHADPA A B,
DURNA JINR - P-1-4796 (69,REC,JAN 70) 9 P.
KEYWORDS: P⁺-P, INTERACTION • FINAL STATES: LAMBDA,
K⁺, P⁺ • A¹(1070) • BUBBLE CHAMBER(HEAVY LIQUID),
EXPERIMENTAL RESULTS •
- 116
PRODUCTION OF P P⁺ P⁺ ENHANCEMENTS FROM THE REACTION K⁺-
P → P P⁺ P⁺ AT 3.9, 4.6, AND 7.3 GEV/C.
BARNES V E, BASSANO D, CHUNG S U, EISNER R L, FLAMINIO E,
KINSON J B, SANDS N P, BROOKHAVEN NATIONAL LAB,
PHYS. REV. LETTERS 23 (1967) 1516-1520.
KEYWORDS: K⁺-P, INTERACTION • FINAL STATES: P, K⁺, P⁺,
P⁺ • A¹(1710), DECAY MODES • FINAL STATES: P, P⁺, P⁺,
K⁺, LAMBDA • DELTA(1236), P⁺ • DELTA(1236) • BUBBLE
CHAMBER(HYDROGEN), EXPERIMENTAL RESULTS •
- 117
K⁺ P ELASTIC SCATTERING AT 4.6 GEV/C.
MACNAUGHTON J M, FEINSTEIN L, MARCELJA F, TRILLING G M,
NUCL. PHYS. B14 (1969) 237-245 AND CALIF UNIV - UCRL-19239
(69,REC,AUG) 17 P.
KEYWORDS: K⁺ P, ELASTIC SCATTERING • K⁺, CROSS SECTION
• SCATTERING AMPLITUDE • BUBBLE CHAMBER(HYDROGEN),
EXPERIMENTAL RESULTS •
- 118
PRODUCTION OF PROTON-ANTIPROTON AND KION-ANTIKION PAIRS IN
FOUR-BODY REACTIONS OF A GEV/C P⁺ AND 10 GEV/C K⁺ ON
PROTONS.
ANDERHOLZ M, DEUTSCHMANN M, RIJMPER K, SPETH R, STEINBERG B,
AACHEN TECH HOCHSCH, KLUGOW J, LANIUS K, WIMAR S, PISF D,
SCHILLER M, BERLIN DEUTSCHE AKAD WISS, ASCHOT G, CECIONI V
T, ELY R, HANSEN J O, KELLNER G, KETTEL M, LINDHOLM K P C,
MORRISON D R D, PALER K, TÖRTE M, CERN GENEVA, DALLMAN D
P, NORMAN P J, LOSTY M J, LONDON IMPERIAL COLLEGE,
MUSCHBECK R, MARKYTAN M, NYER G, NORTH D, SCHMID P, WIEN
INST HOCHENERGIEPHYSIK,
NUCL. PHYS. B14 (1969) 255-268 AND CERN GENEVA -
CERN/D.PH.11/PHYSICS 69-21 (RFC,SEP 69) 27 P.
KEYWORDS: P⁺ P, INTERACTION • FINAL STATES: 3P⁺, P -
P⁺, P, 2K⁺ - P⁺, 2P, ANTI-P • K⁺-P, INTERACTION • FINAL
STATES: K⁺, P, 2P⁺ - 3K⁺, P - K⁺, 2P, ANTI-P • ANTI-P P,
PAIR PRODUCTION • K⁺, PAIR PRODUCTION • P⁺, PAIR
PRODUCTION • P⁺, CROSS SECTION • K⁺, CROSS SECTION •
PHI(1019) • FI(260) • BARYON RESONANCE, DELTA(1236) •
BUBBLE CHAMBER, EXPERIMENTAL RESULTS •
- 119
A STUDY IN THE TRAPPING OF THE LAMBDA HYPERONS PRODUCED
BY K⁺ MESON ABSORPTION IN A HEAVY LIQUID BUBBLE CHAMBER.
CSEJTHEY-BARTH M, SCHROEDER G, VAN AINST P, BRUSSELS
UNIV,
NUCL. PHYS. B14 (1969) 330-336.
KEYWORDS: K⁺ NUCLEUS, ABSORPTION • LAMBDA, PRODUCTION •
HYPERFRAGMENT, PRODUCTION • BUBBLE CHAMBER(HEAVY
LIQUID), EXPERIMENTAL RESULTS •
- 120
K P ELASTIC SCATTERING STUDIED BY THE CHEW-LOW
EXTRAPOLATION METHOD.
DE HARRE W, DEHAISTEUX J, DE WOLF E, DUFUR P, GRARD F,
HEROJET P, MEINGHEBAERT J, NAISSE J, PAPE L, PEETERS P,
VERDEURE F, WIMMOLDERS R, BRUSSELS UNIV, ASSOMPTIEF G,
CHARRIERE G, DEJARD D, GILDSCHMIDT-CLERMONT Y, GRANT A,
HENRI V P, JONGEJANS D, LINGLIN D, MULLER F, PERREAU J M,
PINTROWSKA M, TUOMINEN J K, WOLF G, CERN GENEVA,
NUCL. PHYS. B14 (1969) 425-436 AND CERN GENEVA -
CERN/D.PH.11/PHYSICS 69-17 (69,REC,JUL) 20 P.
KEYWORDS: P⁺-K⁺, ELASTIC SCATTERING • P⁺-K⁺, CHARGE
EXCHANGE • FINAL STATES: K⁺, P⁺ • K⁺, CROSS SECTION •
K⁺(890) • PARTIAL WAVE • BUBBLE CHAMBER, EXPERIMENTAL
RESULTS •
- 121
STUDY OF P⁺-P → LAMBDA K⁰ FROM 944 MEV/C TO 1170 MEV/C.
MYLF J C,
CALIF UNIV - UCRL-18139 (69,REC,JAN 70) 63 P.
KEYWORDS: P⁺-P, INTERACTION • FINAL STATES: LAMBDA, K⁰
• P⁺-, DIFFERENTIAL CROSS SECTION • POLARIZATION •
PARTIAL-WAVE ANALYSIS • TRACK DATA ANALYSIS • BUBBLE
CHAMBER(HYDROGEN), EXPERIMENTAL RESULTS •
- 122
A SURVEY OF EXPERIMENTAL RESULTS ON MULTI-PARTICLE
PRODUCTION FROM HIGH ENERGY P P AND K P COLLISIONS.
PANNINI R,
BROOKHAVEN NATIONAL LAB - BNL-14126 (REC,JAN 70) 50 P.
KEYWORDS: P P, INTERACTION • K P, INTERACTION • P⁺,
MULTIPLE PRODUCTION • P, DIFFERENTIAL CROSS SECTION •
REVIEW • COUNTERS AND DETECTORS, EXPERIMENTAL RESULTS •
BUBBLE CHAMBER(HYDROGEN), EXPERIMENTAL RESULTS •
- 123
A COMPILATION OF K⁺ N REACTIONS.
PRICE L R, BARASH-SCHMIDT M, BENARY D, BLAND R W,
ROSENFELD A M, WOLF C G,
CALIF UNIV - UCRL-20000 (69,REC,JAN 70) 234 P.
KEYWORDS: K⁺ NUCLEON, INTERACTION • K⁺ NUCLEON, ELASTIC
SCATTERING • K⁺, TOTAL CROSS SECTION • K⁺, ANGULAR
DISTRIBUTION • K⁺, DIFFERENTIAL CROSS SECTION •
POLARIZATION • PARTIAL-WAVE ANALYSIS • DIFFERENTIAL •
K⁺(890) • DELTA(1236) • TABLES • REVIEW • BIBLIOGRAPHY •
- 124
THE REACTION K⁺-P → LAMBDA P⁺ IN THE C.M. ENERGY RANGE
1415 TO 2160 MEV.
BREMNER A, RANGAN L K, VRANA J, PARTS COLLEGE DE FRANCE,
BUTTERWORTH I, LITCHFIELD P J, SEAR A M, SMITH J R, MEYER
J, PAUL F, TALLIN M, SACLAY C E M,
CHILTON RUTHERFORD LAB - RPP/H/60 (RFC,JAN 70) 21 P.
KEYWORDS: K⁺-P, INTERACTION • FINAL STATES: LAMBDA, P⁺
• K⁺-, DIFFERENTIAL CROSS SECTION • LAMBDA, POLARIZATION
• PARTIAL-WAVE ANALYSIS • SIGNAL(1915), QUANTUM NUMBER •
SIGNAL(2030), QUANTUM NUMBER • TRACK DATA ANALYSIS •
BUBBLE CHAMBER(HYDROGEN), EXPERIMENTAL RESULTS •
- 125
A PARTIAL WAVE ANALYSIS OF THE REACTION K⁺-N → P⁺-
LAMBDA IN THE CMS ENERGY REGION FROM 1900 MEV TO 2120 MEV.
CHU S F, ISLAM G S, COLLEY D C, EASTWOOD D, FRY J R,
HEATHCOTE F R, BIRMINGHAM UNIV, CAMPBELL J G, COLVINE J G,
COBLEY G, FANCEY M F, HILL J, EDINBURGH UNIV, ANGUS M,
CAMPBELL J R, MORTON W T, NEGUS P J, GLASGOW UNIV, ALL S
S, BUTTERWORTH I, FUCHS F, GYAL D P, MILLER D R, PEARCE
D, SCHWARZSCHILD F, LONDON IMPERIAL COLLEGE,

The indexes produced are:

Author Index [Fig.5]

Preprint and Report Number Index [Fig.6]

Subject Index [Fig.7]

An average fortnightly HEP INDEX number comprises 60 pages. 350 references cover 25 pages, whereas the three indexes make up for the remaining 35 pages. Two master printouts are produced for every number, the first one for proof-reading the author and report number indexes; the second printout is for the offset printing. - The annual cumulative indexes have the same format as the fortnightly ones except for the author index, which gives the titles of the papers in the same format as that of the subject index [Fig.7].

Information Retrieval

The DESY information retrieval system is probably best described by listing its possible query options:

TIME INTERVAL (time intervals down to fortnightly productions);

FIELD TYPE (selection of one or several of the 14 topical fields)

SOURCE (selects specified source, e.g., Phys.Rev.)

SOURCE TYPE (selects, e.g. only articles in periodicals)

TITLES OR TITLE WORDS

AUTHOR(S)

KEYWORD(S)

In the case of titles, authors and keywords, several query terms may be combined by logical AND, OR or NOT.

The HEP INDEX data are stored on magnetic tape in the direct-file mode; it is planned to store the five last years on magnetic disk storage units for direct access.

Manpower and Computer Time

On the basis of an input of 10 000 references per year, the manpower required for the DESY information system is 1 scientist and 1 typist. The programming time needed for this system was 5 man-months.

The computer runs for the production of one issue of the INDEX require a total of 150 seconds CPU-time on the IBM 360/75, comprising 4 input runs, one test production and one actual production run. The scanning of one year's data for retrieval takes 10 seconds computer time; up to 20 queries can be answered in one scanning run.

MUROTA T 350, 690	PADUA UNIV 325, 409, 428, 501, 556, 718	PURDUE UNIV LAFAYETTE 520, 602
MURRAY J J 194	PAGELS M 652	PUSTERLA M 718
MURRO O 599	PAIK M W 74	QUEEN M M 456
MURTAZA G 575	PAKISTAN AT ENERGY COMM 487	QUITK T M 111
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MYAE E A 164	PALAZZI P 94	RABIN M S 113, 194
MYASISHCHEVA G G 41	PALER K 118	RADER R K 93
MYATT G 49	PALERMO UNIV 629	RADERMACHER E 199
	PALMER R B 49	RADIONOV M M 190
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NAPLES UNIV 708	PASCUAL P 320	RAYMOND M 99
NARAI M 289	PASTINE D J 293	REAMES D V 20
NARJOUX J L 102	PATERGIANI G 501	REBI C 454, 502
NATH L M 520	PATKOS A 380	REBI G 486
NATIONAL ACCEL LAB BATAVIA 203	PATTERSON M M 33	REEDER D D 572
NAUENBERG M 564	PATTISON J B M 49	REGGE T 674, 729
NAZARYAN YU R 138, 154	PAULI E 124	REMOVOTH WEIZMANN INST 52, 386, 424
NEAL M A 74	PAVLOVSKAYA V V 171	REITAN A 510
NEFF M 264	PEARCE D 125	REKALO M P 404, 597
NEFKENS B M K 95	PEETERS P 100, 120, 235	RENDOLI E 718
NEGUS P J 125	PELEG E 52	RENNARD F M 398
NEVEU A 548	PELETNINSKY S V 268, 338	RENNER B 628
NEW YORK STATE UNIV BUFFALO 295	PENNEY B 102	RENNER E V 184
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