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PREPRINTS IN PARTICLES AND FIELDS

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1. INTRODUCTION

Problems such as publication delays, concern over published work getting lost in the publication explosion, and the pressure to keep at the forefront of their discipline have led authors in rapidly advancing fields to adopt informal communication media to meet their needs. In some areas of science, preprints provide an important informal medium of information exchange. The term "preprint" is often used very broadly to cover many forms of unpublished written communications. In this paper we shall restrict it to mean primarily an advance copy of an article intended for journal publication.

Preprints have the outstanding advantage of speed, since they are mailed directly to potential readers at the same time the paper is submitted to a journal. There are few journals in which the time between submission and publication of a paper is less than four months, and the average is much longer. In very active fields of research, communication delays of such a length are intolerable. Preprint distribution fills the gap by communicating immediately, to a selected group of interested researchers, information which will ultimately appear in the journals.

It is only fair to point out that scientific communication via preprints has disadvantages, many of which stem from its informality. Preprints are unrefereed and usually unedited; the process by which authors and groups build up their mailing lists is often haphazard (little effort is made to keep them current); and researchers at small institutions tend to be overlooked while well-known researchers at large institutions are flooded with papers of little interest to them. Preprints are hard to locate when they are referenced in other papers. Also, there is fear that increased emphasis on preprints could undermine the traditional media of scientific communication.

In the past few years the preprint and its impact on the journals has become a subject of considerable discussion and study within the American Physical Society and the American Institute of Physics. As a result, about a year ago a new weekly bulletin began publication at SLAC under the auspices of the APS Division of Particles and Fields and the sponsorship of the U.S. Atomic Energy Commission Division of Technical Information. Entitled "Preprints in Particles and Fields (PPF)," it lists current high-energy physics preprints, once on their first appearance as ephemeral documents and again (in an "Anti-preprints" section) when they are formally published in a journal. PPF seems to be providing a low cost remedy to some defects of the preprint system and may, through its section "Anti-preprints", even help to strengthen the journals.

2. THE ROLE OF PREPRINTS IN HIGH-ENERGY PHYSICS

In the field of particle or high-energy physics the practice of distributing large numbers of preprints has been widespread for perhaps the last fifteen years. It has grown in response to the need for researchers in this very active field to communicate as rapidly as possible with their colleagues throughout the world. Preprints in this field are currently being produced and circulated at the rate of about 3000 per year, a figure that has about doubled in the last 5 years. This rapid expansion probably reflects the growth of the field as well as the conviction that preprints serve the desired function of promoting fast information flow among particle physicists. See L. Goldschmidt-Clermont, "Communication Patterns in High-Energy Physics" [1].

The importance of preprints was recognized by some of the large high-energy physics laboratories. O. Piccioni at Brookhaven took the initiative in the late fifties to begin a BNL preprint list; and a very effective preprint handling technique and a list was developed by Mme. L. Goldschmidt-Clermont at CERN. (A major problem at that time was

persuading authors to send preprints to a "library" rather than only to colleagues, a situation which has since been reversed.) When the Stanford Linear Accelerator Center Library was opened in 1962, preprints were the first concern and, with the help of Mme. Goldschmidt-Clermont, a preprint system similar to CERN's took root [2]. At DESY, preprints have for several years been given subject indexing along with the more conventional literature in the DESY HIGH-ENERGY PHYSICS INDEX.

The presence of well organized preprint libraries at large institutions emphasized the information plight of physicists in smaller organizations. Physicists leaving SLAC, for instance, frequently requested that the local preprint list be regularly mailed to their new addresses.

It has been characteristic of preprint distribution in particle physics that its control has rested with the author or the group within which he works. Authors and groups have in the past built-up sizable mailing lists of their colleagues, and personal preprint collections that seemed to continue growing without end. At the Lawrence Radiation Laboratory, for example, preprint mailing lists of several hundred names were gradually accumulated by most of the high-energy physics groups. At SLAC, the theoretical physics preprint mailing list once contained 900 addresses. Such mailing lists have been difficult to keep current. Usually there has been little attempt at any uniform distribution policy, copies being sent to many individuals at one institution, while at another several persons share one copy. The extra cost of such unlimited preprint distribution to individuals and the accumulation of overlapping preprint collections can be large in research institutions such as ours.

3. HISTORY OF EARLY PROPOSALS

Problems and inequities created by the accelerating growth of preprints in particle physics and the increasing burden of distribution and handling at last led to proposals for formalizing and systematizing their distribution. In March 1965 Moravcsik [3] proposed the establishment of a central preprint registry. He suggested that:

> "For each large field of physics (e.g., elementary-particle physics) a central preprint registry should be established. This would be located at some institution active in the field, and would consist of one full or part time clerk whose duty would be to list the title, author, and author's institution of preprints arriving in the registry, and publish the list, say, fortnightly. This list could be obtained on a subscription basis by anybody in the world, by airmail."

He also suggested that physicists working in the same field should group together to set up preprint libraries, after which much of the distribution could be shifted from individuals to preprint libraries.

The U.S.AEC became interested in the proposal, and also in a more far-reaching scheme of centralized preprint distribution. The result was a new proposal developed by Moravcsik and Gottschalk (AEC) for a Physics Information Exchange (PIE). The plan for the PIE was formally presented by Moravcsik at the American Physical Society's Information Symposium in January 1966 [4]. Under it the PIE would take central responsibility for maintaining preprint mailing lists and for handling duplicating and mailing. An author would supply PIE with a good reproducible copy of his preprint from which the required number would be duplicated and distributed to preprint libraries set up by groups of researchers working in proximity. The PIE was to be limited for a trial period to papers in the field of theoretical high-energy physics.

The notion of a formalized preprint exchange system was not new. A program of this kind was tried in the biomedical field under NIH auspices starting in 1961 with the Information Exchange Group (IEG) 1. The number of IEG's grew to 7 by 1965 and the number of participants to about 4500. Each group functioned in a rather narrow technical area. Membership was by approval of the group chairman who was responsible for its operation. The IEG's were discontinued in early 1967 when NIH could no longer finance them ($400 000 in 1966), and under growing pressure from the International Union of Biochemistry Editors, which decided to refuse to publish papers which had been distributed as preprints. The IEG program has been described by Albritton [5], Green [6], and others.

Moravcsik's proposal was discussed widely, and at times heatedly, among physicists and journal editors [7,8,9]. In order to provide a basis for any positive action the AEC agreed to finance a study by the AIP to determine the feasibility and desirability of a PIE. The contract initiating the study project was granted in June 1966. It also covered the preparation of the design for an experimental PIE service. A report on the study was issued in Aug 1967 by Libbey and Zaltman [10]. The principal conclusions of the study were:

1. The possible value of a centralized distribution service for preprints in high-energy theoretical physics would appear to justify experimenting with such a service for a trial period.

2. The experiment should be carried out in two steps:
   Phase I. A weekly preprint announcement service and concurrent directory service for theoretical high-energy physicists would be operated for six months.
   Phase II. Hard copy distributions of preprints directly to selected individuals would be added to the announcement and directory service between 4 to 6 months after the start of Phase I. Phases I and II would end 18 months from the beginning of Phase I.

It was estimated that the cost of the 1-1/2 year experiment would be approximately $360 000.

4. REDUCING THE COST OF PREPRINT DISTRIBUTION

While the merits of a PIE were being argued, LRL and SLAC, independently decided to simplify and systematize their preprint distribution which, as previously described, had grown very expensive.

The experience was almost identical at the two labs. The preprint mailing lists for the several high-energy physics groups were consolidated and analyzed, and the addresses were brought up to date. The conclusion was that it would be possible to reach essentially all the individuals on the list via preprint libraries, or at least to limit each institution to one or two preprint copies. In many other high energy physics institutions the same process was going on, that is, preprint mailing list policy was being switched to "groups only" for automatic distribution, with copies to individuals only on request.

LRL also studied various other ways of reducing the printing and distribution costs, and as a consequence is now producing preprints typed double-column with one and a half spaces between lines. These are photoreduced to 80 percent. The overall reduction in space is more than a factor of two and yields a page which has type the same size as that of a journal and seems very acceptable to readers and to journal editors. Mailing labels are then applied directly to the backs of the preprints which are then mailed without envelopes.

The experience and information gained during this effort were valuable in the later LRL-SLAC collaboration on plans for a new preprint announcement service.

5. A NEW PREPRINT ANNOUNCEMENT SERVICE

In 1968 one of the first problems considered by the newly formed Division of Particles and Fields of the American Physical Society was whether it should sponsor one of the several proposals for organizing or distributing preprints. In April 1968 it was agreed that the Division should support, as a first step, the preparation and distribution of a preprint accession list. Experience in the SLAC library (serving 100 to 130 high energy physicists) had indicated that from each list of 50 to 75 preprints, the average user read only two or three preprints. Not more than five or six preprints from one list were of interest to more than two or three people. Of all preprints announced, only 20 to 30 percent were ever requested by anyone. Thus, a practical solution to the "preprint problem" seemed to lie in timely announcement of currently available preprints rather than in expensive proliferation of all preprints. A list approach would also allow authors and their institutions to retain traditional control over the actual distribution of their preprints.

Panofsky (SLAC) and Rosenfeld (LRL), respectively Chairman and Secretary of the Division, agreed to work out the details. They soon decided that a combination of the best features of the SLAC and LRL preprint accession lists would provide an adequate service. The LRL quick-scan format was adopted, as it proved most popular with physicist readers. The well-established SLAC preprint collection provided the base on which the list was built. The SLAC collection had the additional attraction that its preprints were being entered in an experimental on-line retrieval system (SPIRES) at Stanford University [11], so that the master copy for a weekly list could be computer-produced and duplicated very quickly (preprints received by 5 p.m. Wednesday are included on the list mailed on Friday). Also, since 1963 the SLAC Library had been systematically discarding preprints as soon as they were published and a list of these discards ("Anti-preprints"), with relevant publication information, had been informally circulated to several other preprint libraries. "Anti-preprints" was converted to the LRL list format and became a part of the new bulletin.

The cost of printing and mailing a list to 1000 to 1500 subscribers (assuming repro-ready copy donated by SLAC and SPIRES) was estimated at up to $15 000 for 18 months (in contrast to $360 000 for a full-scale PIE).

The result was "Preprints in Particles and Fields" (PPF), which began weekly publication at SLAC in January 1969, with financial support from the U.S. Atomic Energy Commission Division of Technical Information for an experimental 18-month

period. Plans were made to sample user reaction and incorporate worthwhile suggestions. If the service proved successful, it might be continued on a subscription basis. Sample pages from PPF and Anti-Preprints are given in Appendix A.

Because CERN distributes a preprint list covering essentially the same 3000 items per year received by the SLAC and LRL libraries, it was decided to limit the distribution of PPF initially to the greater Western Hemisphere (including Japan, Australia, and New Zealand). Recently, however, secondary distribution arrangements have been made by a laboratory in India and is under discussion for England. (The "Anti-preprints" section is in particular demand in areas beyond the normal range of PPF.) Currently PPF is being received by about 1600 recipients, including 150 high-energy physics preprint libraries, at a cost of about $8 per year per subscriber.

6. USER RESPONSE TO PPF

A preliminary subscriber survey was made in April 1969 by means of a questionnaire included with PPF Issue No. 11. The purpose was: (a) to discover whether PPF was thought to be really useful, (b) to learn whether first class mail in the U.S. was really going by air and arriving in the East on Monday or Tuesday, (c) to elicit comments and suggestions from subscribers, and (d) to reduce the mailing list to those who genlunely wanted PPF.

The questionnaire went to some 1600 recipients from which 1031 replies were received. Only 29 of these did not wish to continue to get PPF. The 29 and the 569 from whom no replies were received were dropped from the mailing list. (Some were later restored.) The results can be summarized by saying that the PPF service seems to fill successfully a genuine gap in particle physics information dissemination without formalizing preprints or overlapping with existing services (such as the DESY HIGH-ENERGY PHYSICS INDEX). The emphasis on speed and completeness allows the use of PPF in place of locally produced accession lists. The anti-preprint list is helping preprint librarians to weed their preprint collections and physicists and journal editors to locate published versions of preprints for citation purposes. Several organizations have already ceased, or are planning to cease, publishing their own lists, or are using PPF as a basis for their local announcement services.

The suggested subscription price of $8 per year was thought by most to be reasonable. Many expected to realize savings by discontinuing local listings and by reducing the number of preprints distributed. The regular announcement of preprints in

PPF makes it easier for an author to limit the initial distribution of his preprints to libraries and groups without fear that anyone interested will miss his work. It seems unlikely that the cost can be substantially reduced except at the sacrifice of timeliness, which is one of the main assets of PPF. We are, however, experimenting with user acceptance of greater photoreduction.

A surprising number of respondents offered comments and suggestions. One suggestion, made repeatedly, was that an address list of sources of preprints be prepared and distributed so that authors might be contacted for copies of particular papers. We had planned to publish such a list annually and so were able to respond quickly by including a six-page address supplement with issue No. 19 in June. (Thus far, preprints from 420 different institutions have appeared on PPF.) Some small changes in format have also been made as the result of suggestions elicited by the questionnaire.

7. QUESTIONS FOR THE FUTURE

It seems clear that PPF performs a useful services to its subscribers (now numbering about 1600 including SLAC and LRL); but what is to be its future after the initial subsidy ends in June 1970? Possible alternatives are:

a. Continue PPF as a subsidized publication of the AEC, with the Division of Particles and Fields and SLAC as sponsors. The annual costs might be $12 000 to $15 000 without controlled circulation. With some circulation controls the cost could probably be kept to the level of $10 000 - $11 000 per year. This assumes that SLAC continues to provide reproducible copy and maintains the address list.

b. Place PPF on a subscription basis either under arrangements with AIP or with a commercial publisher. It is estimated that the subscription billing and other expenses would add $2 per year, bringing the cost to at least $10 per year.

c. Place PPF on a subscription basis with billing handled at SLAC at no increase in cost.

d. Continue PPF as a SLAC-subsidized publication, possibly with contributions from other large AEC laboratories having active research programs in high-energy physics.

e. A combination of c. and d. to keep down the subscription price by partial subsidy.

Current DTI budget limitations rule out alternative (a). A recent recommendation by the national High Energy Physics Advisory Panel (HEPAP) that SLAC do what is necessary to keep PPF going makes it likely that alternative (c) or (e) will be chosen. In any case, another survey of subscribers is planned soon to determine the number of continuing subscriptions should a $5 to $8 fee be levied. It seems essential that any subscription fees be kept well within the range of individuals if PPF is to continue effective in its present role.

8. SUMMARY

In some areas of science preprints have become an important informal communication medium. The field of high-energy physics makes particularly heavy use of preprints. Growing problems led to a proposal for formalizing preprint distribution among high-energy physicists by creating a Physics Information Exchange (PIE). A study of the desirability of PIE made by the American Institute of Physics with AEC support led to the recommendation that, as a first step, a preprint announcement service be tried. The Division of Particles and Fields of the American Physical Society with the cooperation of the Stanford Linear Accelerator Center and the Lawrence Radiation Laboratory (Berkeley) decided to publish a weekly preprint announcement list. Financial support was received from the AEC. The new weekly publication "Preprints in Particles and Fields" (PPF) and its companion "Anti-preprints" were started at SLAC in January 1969. A user survey made in April 1969 indicated that PPF is successfully meeting a genuine need in particle physics information dissemination.

REFERENCES

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[9] Eds., Nature 211 (1966) 333, 897.

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APPENDIX A

SAMPLE PAGES FROM PPF AND ANTI-PREPRINTS

PREPRINTS
in Particles and Fields

P. O. BOX 4349
STANFORD, CALIFORNIA 94305

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26 DECEMBER 1969 PPF-69-48

PREPRINTS IN PARTICLES AND FIELDS (PPF) lists new high-energy physics preprints received during the past week at the Stanford Linear Accelerator Center Library. It also provides, in the "Anti-Preprint" section, references to published versions of former preprints.

To obtain a copy of an item on this list, check your own preprint library or write directly to the author. PLEASE *DO NOT* REQUEST PREPRINTS FROM SLAC, except, of course, those by SLAC authors. "Print" and "Rx" report numbers are assigned by SLAC to unnumbered preprints and should *not* be used in requests or references.

PPF is published *weekly* by the SLAC Library in cooperation with the Division of Particles and Fields of the American Physical Society. It is sponsored by the U.S. Atomic Energy Commission Division of Technical Information. The text is produced on a time-sharing computer system through the courtesy of SPIRES (*S*tanford *P*hysics *I*nformation *RE*trieval *S*ystem) and the National Science Foundation.

High-energy physicists and preprint libraries in the Western Hemisphere may request PPF from:

Stanford Linear Accelerator Center Library
Attn: PPF
P.O. Box 4349
Stanford, California 94305

If your address is going to change soon, please fill in your new address below and return this *whole* sheet to us!

PLEASE CHANGE MY ADDRESS TO: _____

_____

_____

Preprints in Particles and Fields

Report No.	*	Title	Authors
BNL-14222	E	EXPERIMENTAL TESTS OF (rho, A2) AND (K*, K**) EXCHANGE DEGENERACY IN FORWARD MESON - BARYON SCATTERING. n.d. 39p.	Kwan Wu Lai, James Louie (Brookhaven)
CERN-TH-1105	T	FINAL STATE COULOMB CORRECTIONS TO NEUTRINO REACTIONS. Dec 1969. 21p.	O. Nachtmann (CERN)
CERN-TH-1109	T	POLARIZATION EFFECTS IN p p AND anti-p p SCATTERING AT HIGH ENERGIES. Nov 1969. 12p.	M. Jacob, J. Weyers (CERN)
Print-69-3147 (CLAREMONT)	T	GENERAL FERMION REGGEIZATION WITHOUT PARITY DOUBLING. Dec 1969. 6p.	S.A. Klein (Claremont Coll.)
COO-881-764	T	ANALYSIS OF CROSSING SYMMETRY VIOLATION IN A UNITARIZED pi pi SCATTERING AMPLITUDE. Nov 1969. 19p.	H.M. Lipinski (Wisconsin U., Madison)
COO-1428-152	E	CONFIRMATION OF A NEW LAMBDA pi RESONANCE IN THE REACTION K-minus + n ---> LAMBDA + pi-plus + pi-minus + pi-minus. Nov 1969. 13p.	A.C. Ammann, A.F. Garfinkel, D.D. Carmony, L.J. Gutay, D.H. Miller (Purdue U.); W.L. Yen (Indiana U.-Purdue U., Indianapolis)
DEMO 69/3	T	MODELS FOR HIGH-ENERGY PHOTOPRODUCTION PROCESSES. Nov 1969. 35p.	A. Verganelakis (Democritus Nuclear Research Center)
Print-69-3161 (DURHAM)	T	DUALITY FUNCTIONS IN A MESON BARYON MODEL. n.d. 13p.	D.B. Fairlie, K. Jones (Durham U.)
EFI-69-87	T	MASS DEPENDENCE OF THE DIFFRACTION PEAK IN RESONANCE PRODUCTION AND THE MULTIPOINT VENEZIANO MODEL. Oct 1969. 12p.	Ronald E. Waltz (EFI, Chicago U.)
EFI-69-90	T	FORM FACTOR MODELS AND CHIRAL SYMMETRY. Oct 1969. 11p.	P.H. Frampton (EFI, Chicago U.)
Print-69-3169 (ETH, ZURICH)	T	DESCRIPTION OF INSTABLE PARTICLES BY NONUNITARY IRREDUCIBLE REPRESENTATIONS OF THE POINCARE GROUP. Nov 1969. 23p.	Markus Simonius (ETH, Zurich)
Print-69-3157 (HARVARD)	E	ELASTIC ELECTRON - PROTON SCATTERING CROSS SECTIONS MEASURED BY A COINCIDENCE TECHNIQUE. n.d. 104p.	M. Goitein, R.J. Budnitz, I.L. Carroll, J.R. Chen, J.R. Dunning, Jr., K. Hanson, D.C. Imrie, C. Mistretta, Richard Wilson (Harvard U.)
Print-69-3163 (HARVARD)	E	TEST OF TIME REVERSAL INVARIANCE IN INELASTIC e-p SCATTERING. n.d. 93p.	J.A. Appel (Harvard U.); J.R. Chen (Penn U.); J. Sanderson, G. Gladding (Harvard U.); M. Goitein (UCRL, Berkeley); K. Hanson (Harvard U.); D.C. Imrie (University Coll., London); T. Kirk, R. Madaras, R.V. Pound, L. Price, Richard Wilson (Harvard U.); C. Zajde (Orsay, LAL)
Print-69-3148 (IAS, PRINCETON)	T	CROSSING SYMMETRY, OSCILLONS, POSITRONIUM, AND NARROW RESONANCES. n.d. 7p.	Joel Yellin (IAS, Princeton)
Print-69-3162 (IAS, PRINCETON)	T	THE EXISTENCE OF COVARIANT TIME ORDERED PRODUCT OF CURRENTS. n.d. 35p.	R.F. Dashen (IAS, Princeton); S.Y. Lee (UCLA)
ITP-264	T	FACTORIZATION AND CYCLIC STRUCTURE IN THE GENERALIZED VENEZIANO MODEL. Sep 1969. 13p.	I. Montvay (Eotvos Lorand U.)
JINR-P4-4761	T	GENERALIZED KRAMERS-FOKKER-PLANCK EQUATION. Oct 1969. 15p. (In Russian)	A.G. Bashkirov, D.N. Zubarev (Dubna, JINR)
JINR-P10-4769	C	PROGRAM FOR CALCULATING KINEMATIC PARAMETERS OF THE ELECTRON TRACKS IN BUBBLE CHAMBERS AND THE RESULTS OF STATISTICAL TEST OF THIS PROGRAM. Nov 1969. 21p. (In Russian)	L.N. Gerdyukov, B.A. Manyukov, P.V. Shlyapnikov (Dubna, JINR)
KYUSHU-69-E-5	T	FINITE ENERGY SUM RULES AND DUALITY OF SAKATON REARRANGEMENT DIAGRAMS. Oct 1969. 29p.	Masahiro Imachi (Kyushu U.)
Print-69-3156 (MASS. U., AMHERST)	T	ANALYTIC HARD PION METHODS: THE A1 rho pi SYSTEM. n.d. 46p.	J.J. Brehm, E. Golowich (Massachusetts U., Amherst)
Print-69-3158 (MPI, MUNICH)	T	CALCULATION OF THE TRANSITION MATRIX OF THE WICK-CUTKOSKY MODEL. Jun 1969. 14p.	E. zur Linden (Max Planck Inst., Munich)
Print-69-3159 (MPI, MUNICH)	T	O(5) CLASSIFICATION OF BETHE-SALPETER SOLUTIONS. Oct 1969. 15p.	P. Breitenlohner, E. zur Linden (Max Planck Inst., Munich)
Print-69-3160 (MPI, MUNICH)	T	INTEGRAL TRANSFORMATIONS IN MOMENTUM SPACE AND CONFORMAL INVARIANCE. Oct 1969. 7p.	L. Castell (Max Planck Inst., Munich)
Print-69-3145 (NORDITA)	T	CALCULATING PARTIAL WAVE AMPLITUDES ON THE LEFT-HAND CUT. Aug 1969. 24p.	J. Lyng Petersen (NORDITA)

*C=Computing E=Experimental I=Instrumentation R=Review T=Theoretical

Anti - Preprints

First Author	PPF Nº	Partial Title, Date, Report Nº	Publication Info.
		"ANTI-PREPRINTS" is a bi-weekly list of erstwhile preprints which have been published in current journals. The preprints may now be discarded, and reference made to the journal publication. The list is alphabetical by first author. Titles with no PPF number in column 2 are those which predate PPF.	
Alexander, Gideon	69-28	LAMBDA AND SIGMA INTERACTIONS WITH PROTONS. Jul 1969. 15p. <TAUP-96-69>	Proc.Intnl.Conf.Hypernuclear* Physics:5-50,1969
Cheng, Hung & Tai Tsun Wu	69-41	LONGITUDINAL MOMENTUM DISTRIBUTION OF PIONIZATION PRODUCTS. n.d. 8p. <PRINT-69-2774(MIT)>	Phys.Rev.Lett.23:1311,1969
Cline,D., et al.	69-22	STUDY OF Y-N AND Y-Y INTERACTIONS USING FINAL STATE INTERACTIONS. n.d. 65p. <PRINT-69-1538(Hawaii,etc.)>	Proc.Intnl.Conf.Hypernuclear* Physics:92-158,1969
Cline,D., et al.	69-28	TEST OF (rho, A-2) EXCHANGE DEGENERACY, DUALITY, AND EVIDENCE FOR SECONDARY TRAJECTORIES OBTAINED FROM (KN, anti-K-N) CHARGE EXCHANGE REACTIONS. n.d. 12p. <PRINT-69-1927(Hawaii)>	Phys.Rev.Lett.23:1318,1969
Dalitz,R.H.	69-40	THE PRESENT PROBLEMS AND FUTURE OUTLOOK IN LAMBDA-HYPERNUCLEAR PHYSICS. n.d. 48p. <PRINT-69-2679(Oxford)>	Proc.Intnl.Conf.Hypernuclear* Physics:708,1969
Dubovikov,M.S. & I.M.Narodetskii		INTERFERING EVENTS IN THE DECAY X ---> pi + rho AND THE DETERMINATION OF THE QUANTUM NUMBERS OF THE A-2 MESON. Apr 1968. 19p. <ITEP-608> (IN RUSSIAN) *Title changed in journal*	Sov.J.Nucl.Phys.8:716,1969 (IN ENGLISH)
Eisenberg,Y., et al.	69-43	PHOTOPRODUCTION OF THE A-2 MESON IN THE REACTION gamma + p ---> n + pi-plus + pi-plus + pi-minus AND AN ESTIMATE OF THE A-2 gamma pi WIDTH. Nov 1969. 8p. <SLAC-PUB-690>	Phys.Rev.Lett.23:1322,1969
Englert,F., et al.	69-33	THE OPTICAL LIMIT OF RELATIVISTIC SCATTERING. n.d. 24p. <PRINT-69-2313(Brussels)>	Nuovo Cim.64A:561,1969
Heckman, Harry H.	69-27	WHAT'S NEW AND OLD IN THE RANGE-ENERGY RELATION? May 1969. 22p. <UCRL-19214>	Proc.Intnl.Conf.Hypernuclear* Physics:199,1969
Hite, Gerald E.	69-07	REVIEW OF RECENT DEVELOPMENTS OF THE REGGE POLE MODEL. n.d. 184p. <PRINT-69-498(Oregon)>	Rev.Mod.Phys.41:669,1969
Honecker,R., et al. (Aachen-Berlin-Bonn-CERN-Cracow... Collab)	69-32	GENERAL CHARACTERISTICS OF PARTICLE PRODUCTION IN 16GeV/c pi-minus p INTERACTIONS. Jul 1969. 27p. <CERN/DPhII/Phys-69-18>	Nucl.Phys.B13:571,1969
Jaffe, Arthur M.	69-03	WHITHER QUANTUM FIELD THEORY? Feb 1969. 19p. <PRINT-69-270(Harvard)>	Rev.Mod.Phys.41:576,1969
Krammer,M. & U.Maor	69-15	A rho + R REGGE POLE MODEL FOR ISOBAR PRODUCTION. n.d. 22p. <TAUP-78-69>	Nucl.Phys.B13:651,1969
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