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Current Experiments in Elementary Particle Physics

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CURRENT EXPERIMENTS IN ELEMENTARY PARTICLE PHYSICS

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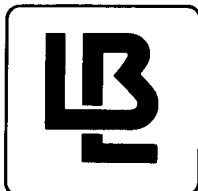
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EXAMPLE FROM THE MICROFICHE (INSIDE BACK COVER)

FOR ABBREVIATIONS USED FOR PARTICLES, INSTITUTIONS, ETC., SEE THE YELLOW PAGES.

CERN-UA-001 (JAN 1978); APPROVED JUN 1978, JUN 1983, SEP 1983, FEB 1984.

A 4PI SOLID ANGLE DETECTOR FOR THE SPS USED AS A PROTON-ANTI-PROTON COLLIDER AT A C.M. ENERGY OF 540 GEV

AACH -- K EGGERT, P ERHARD, H FAISSNER, H GRASSMANN, H LEHMANN, H MOSER, E RADERMACHER, T REDELBERGER, H REITHLER, E TSCHESLOG
ANIK -- J DORENBOSCH, R HERTZBERGER, D HOLTHUIZEN, B VAN EIJK
LAPP -- B AUBERT, P CATZ, J COLAS, M DELLA NEGRA, P GHEZ, A GONIDEC, J P LEES, D LINGLIN, M N MINARD, J P VIALLE, M YVERT
BIRM -- M CORDEN, J DOWELL, J GARVEY, R J HOMER, I KENYON, T MCMAHON, J STREETS, P WATKINS, J WILSON
CERN -- A BEZAGUET, R BOCK, P CENNINI, S CITTOLIN, M DEMOULIN, D DIBITONTO, N ELLIS, H HOFFMANN, W JANK, G JORAT, D KRYN, A LEVEQUE(**SPOKESPERSON), M LEVI, T MARKIEWICZ, G MAURIN, O MEYER, T MEYER, F MULLER, L NAUMANN, A NORTON, F PAUSS, A PLACCI, J P PORTE, R RAJA, P ROSSI, J P REVOL, M RIJSSENBEEK, C RUBBIA(**SPOKESPERSON), B SADOULET, D SCHINZEL, K C T O SUMOROK, V VUILLEMIN, R WILKE, T WYATT
HARV -- S GEER, M GOODMAN, J ROHLF, R WILSON
HELS -- V KARIMAKI, R KINNUNEN, E PIETARINEN, M PIMIA, J TUOMINIEMI
LOIC -- I SIOTIS, J VIRDEE
LOQM -- R BATLEY, E BUCKLEY, E EISENHANDLER, W R GIBSON, A HONMA, P KALMUS, R KEELER, P KYBERG, G SALVI, G THOMPSON
PADO -- A BETTINI, G BUSETTO, S CENTRO, M DE GIORGI, A MENEGUZZO, D PASCOLI
CDEF -- L DOBRZYNSKI, G FONTAINE, C GHESQUIERE, Y GIRAUD-HERAUD, J P MENDIBURU, A ORKIN-LECOURTOIS, G SAJOT, J VRANA
UCR -- R FREY, P GUTIERREZ, C HODGES, J MAN, W KOZANECKI, K MORGAN, J RANSDALL, D SMITH
ROMA -- C BACCI, F CERADINI, G CIAPETTI, ACCIO, F LACAVA, M MORICCA, L PAOLUZI, G PIANO-MORTARI, G SALVINI, L
RHEL -- M ALBROW, G ARNISON, A ASTBURY, PRAYER, W J HAYNES, A K NANDI, C ROBERTS, W SCOTT, T SHAH
SACL -- C COCHET, M DEBEER, D DENEGRI, A GIVERNA, LAUGIER, E LOCCI, M LORET, J RICH, J SAAS, A SAVOY-NAVARRO
VIEN -- D DALLMANN, R FRUHWIRTH, J STRAUSS, F SZONIK, AHL, C WULZ
WISC -- G BAUER, D CLINE, M MOHAMMADI
KIEL -- O C ALLKOFER, D DAU, R LEUCHS, S LEVERGRUN

<ACCELERATOR> CERN-PBAR/P <DETECTOR> JA1

<REACTIONS STUDIED>
AP P -->

, 630 GEV (ECM)

<PARTICLES STUDIED>
W+, W-, Z0, HIGGS, SUPERSYM

<EXPERIMENTAL COMMENT> HAS DISCOVERED THE W AND Z BOSONS AND ALSO FOUND A FEW EVENTS COMPATIBLE WITH THE EXISTENCE OF THE TOP QUARK. THE PRESENT PROGRAM INCLUDES A SEARCH FOR VARIOUS HIGH-MASS PARTICLES SUCH AS NEW QUARKS AND SUPERSYMMETRIC PARTICLES, AND AN INVESTIGATION OF QUARK AND GLUON INTERACTIONS, ETC. FOR A DESCRIPTION OF THE APPARATUS, SEE THE LBL-91 SUPPLEMENT ON DETECTORS. TAKING DATA (NOVEMBER 84).

<PUBLISHED PAPERS> PL 118B (1982) 167, PL 118B (1982) 173, PL 121 (1983) 77, PL 122B (1983) 103, PL 122B (1983) 189, PL 123B (1983) 108, PL 123B (1983) 115, PL 126B (1983) 398, PL 128B (1983) 336, PL 129B (1983) 273, PL 132B (1983) 214, PL 132B (1983) 223, PL 134B (1984) 469, PL 135B (1984) 250, PL 136B (1984) 294, AND PL 139B (1984) 11

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CURRENT EXPERIMENTS IN ELEMENTARY PARTICLE PHYSICS

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Abstract -- This report contains summaries of 551 approved experiments in elementary particle physics (experiments that finished taking data before 1 January 1980 are excluded). Included are experiments at Brookhaven, CERN, CESR, DESY, Fermilab, Moscow Institute of Theoretical and Experimental Physics, Tokyo Institute of Nuclear Studies, KEK, LAMPF, Leningrad Nuclear Physics Institute, Saclay, Serpukhov, SIN, SLAC, and TRIUMF, and also experiments on proton decay. Properties of the fixed-target beams at most of the laboratories are summarized. Instructions are given for searching online the computer database (maintained under the SLAC/SPIRES system) that contains the summaries.

**The Berkeley Particle Data Group is supported by the Director, Office of Energy Research, Office of High Energy and Nuclear Physics, Division of High Energy Physics of the U.S. Department of Energy under Contract No. DE-AC03-76SF00098, and by the U.S. National Science Foundation under Agreement No. PHY83-18358.*

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Microfiche with summaries	Inside back cover

INTRODUCTION

The microfiche at the back of this report contains summaries of 551 approved experiments in elementary particle physics. An example from the summaries is given on the inside front cover. Note that a summary includes a list of the published papers that have come from the experiment. A list of all the experiments with their titles begins on p. 5. Experiments that finished taking data before 1 January 1980 are not included here but are available on a computer database (see below). Experiments at the following laboratories are included:

Brookhaven (BNL)	KEK
CERN	Leningrad Nuclear Physics Institute (LENI)
CESR	Los Alamos (LAMPF)
DESY	Saclay
Fermilab (FNAL)	Serpukhov (SERP)
Institute for Nuclear Studies, Tokyo (INS)	SIN
Institute for Theoretical and Experimental Physics, Moscow (ITEP)	SLAC
	TRIUMF

There are also summaries of proton decay experiments (P-DECAY).

Computer database -- This report is produced from a computer database maintained at SLAC under the SPIRES database management system. The database, named EXPERIMENTS, also contains information from earlier editions of this report about many experiments completed before 1980 (going back to about 1975, and including experiments at Argonne and Rutherford). A guide to gaining access to and searching the EXPERIMENTS database online begins on p. 3.

Sources of information -- Our first information about an experiment usually comes from the proposal for the experiment. Then we follow the progress of the experiment as best we can in laboratory reports such as "Experiments at CERN in 1984" and the "SLAC Users' Bulletin." Finally, a few months before an edition of this report is to appear, we send copies of the summaries of the experiments to the spokespersons for checking and updating. If a reply is received -- as was the case for well over half the experiments -- there is a "*" next to "spokesperson" on the summary. (A single "*" indicates a reply for our 1983 edition, but none this time.)

Supplement on detectors -- This report has a supplement entitled "Major Detectors in Elementary Particle Physics." For each detector, there is a 2-page summary giving properties and performance characteristics and a diagram. The second edition, covering about 50 detectors, appears together with this edition of "Experiments."

Guides to the microfiche -- There are four aids for finding particular experiments on the microfiche. One is the list of experiments and their titles already mentioned. The second is an index of initial-state particles and beam momenta, in order of increasing particle mass and momentum. The third is an index of spokespersons. Finally, the table of contents of "Major Detectors in Elementary Particle Physics" lists the experiments that use the detectors described therein.

Abbreviations -- To keep the summaries on the microfiche brief, abbreviations are used to

indicate journals, kinematic variables, accelerators, detectors, particles, and institutions. The abbreviations are usually obvious but are defined in the yellow pages at the center of the report.

Properties of particle beams -- Tables at the back of the report summarize the properties of beams for fixed-target experiments at Brookhaven, CERN, Fermilab, KEK, LAMPF, Serpukhov, SIN, SLAC, and TRIUMF.

Acknowledgments -- We thank L. Addis (SLAC) for much help with the SPIRES database system, M. Ferro-Luzzi (CERN) for permission to make extensive use of "Experiments at CERN in 1984," J. Coleman (FNAL) for information about Fermilab experiments, G. Bunce (BNL) for information about Brookhaven experiments, J. Doornbus (TRIUMF) for a discussion about TRIUMF beams, and the 349 spokespersons who took the time to reply to our inquiries.

Comments and requests -- We invite comments pointing out omissions, obscurities, out-of-date information, and errors. Comments should be sent to:

Particle Data Group (50-308)
Attn: EXPERIMENTS
Lawrence Berkeley Laboratory
Berkeley, CA 94720
USA

Requests for copies from the Americas, Australasia, and the Far East should go to the above address, while those from other areas should go to:

CERN Scientific Information Service
CH-1211 Geneva 23
Switzerland

SEARCHING THE EXPERIMENTS COMPUTER DATABASE ONLINE

As mentioned in the Introduction, the information in this report, and similar information about many earlier experiments, is contained in a computer database named EXPERIMENTS maintained at SLAC under the SPIRES database management system.

Anyone who has a SLAC account can access this database online. If you have an account but are unfamiliar with SPIRES, a "Guide to VM SPIRES" is available from the SLAC Library, Bin 196, SLAC, P.O. Box 4349, Stanford, CA 94305, USA (phone: 415/854-3300, ext. 2411). If you do not have an account and cannot find anyone who does (at main laboratories, ask at the library), contact Louise Addis of the SLAC Library. If you just want to try out the system, contact us about using a temporary guest account: Particle Data Group, 50-308, Lawrence Berkeley Laboratory, Berkeley, CA 94720, USA (phone: 415/486-5885, or FTS 451-5885).

The EXPERIMENTS database is also available under a different system in Europe (contact M. Whalley, Dept. of Physics, Univ. of Durham, South Road, Durham DH1 3LE, England) and in the USSR (contact V. V. Ezhela, Inst. for High Energy Physics, Serpukhov, Moscow Region, USSR).

A brief description of how to use the EXPERIMENTS database under SPIRES follows. Words *not* enclosed in angular brackets <> are to be typed in as given (only the letters in **BOLDFACE UPPER CASE** are needed, and these may be entered in upper or lower case). Words in angular brackets are "variables" for which the user substitutes an appropriate value, again in either upper or lower case (the brackets are *not* typed).

If you will be communicating with the SLAC computer (an IBM 3081 running VM/CMS) at 1200 BAUD or less (such as over telephone lines or with a hardcopy terminal), you will need to set your terminal/modem for half-duplex operation, and you will be running in line-by-line mode. If you will be communicating at a speed greater than 1200 BAUD, you will need to use full-duplex operation, and you will be running in full-screen mode. You will usually connect to the computer through the "MICOM switch," which will ask you what "class" you want. If you are set up for line-by-line mode, type:

VM

If you are set up for full-screen mode, type:

24VM

In full-screen mode, you will then be asked to type a carriage return, and for the kind of terminal you are using (e.g., VT100 or ADM3A). Finally, in either mode, type an extra carriage return after you see the message VM/370 ONLINE. [Note that in full-screen mode, whenever the screen fills up (indicated by the word MORE at the bottom), you must clear it by hitting the CLEAR key (which may be ENTER or CONTROL-Z on your terminal). Also, if you are listing out information and want to terminate the listing prematurely, type in HT and a carriage return before hitting the CLEAR key. In line-by-line mode, you can terminate a listing prematurely by hitting the BREAK or ATTN key.]

After going through the above connection procedure, log on to the computer by typing:

Logon <your-account>
(e.g., Logon **JDOE**)

Then type your password when asked for it (it will not show on your terminal), and finally type an extra carriage return after the system gives its introductory messages.

To enter the SPIRES system, type:

SPIRES

To get a detailed explanation of how to use a particular SPIRES command, type:

EXPLAIN <command-word>
(e.g., **EXPLAIN FIND, EXPLAIN EXPLAIN, EXPLAIN EVERYTHING**)

To access the database, type:

SELECT EXPERIMENTS

To find out what indices are available for searching in this database (and the various index names you may use to refer to them), type:

SHOW INDEX

To see a random selection of values in an index (and thus determine the form to use for a search value), type:

BROuse <index-name>
(e.g., **BRO**use **EX**Periment-num)

To see a selection of values in an index near a particular value (perhaps to see if a value you are interested in is valid, or to see nearby values), type:

BROuse <index-name> <value>
(e.g., **BRO**use **EX**Periment-num **SLAC-PEP**)

To search for experiments satisfying certain criteria, type:

FIND <index-name> <value> **AND(OR)** <index-name> <value> ...

Some sample searches are:

FIND **EX**Periment-num **CERN-UA-001**
FIND Author **RUBBIA**
FIND **DE**Tector **OMEGA OR OMEGAPRIME**
FIND Title **J/PSI**

This finds any experiment with J/PSI as part of the title.

FIND **CIT**ation "**PRL 46 (1981) 1115**"

Note that the above form, with spaces but no commas between the elements, must be used. Note also the quotes which are required here and in the following two examples; for an explanation, see the discussion below on *Searching Problems*.

FIND **RE**action "**PI- P --> PI0 N**" **AND** **ACC**elerator **KEK**

The "arrow" here is composed of two minus signs and a greater-than sign. Specifying the reaction as, e.g., **PI- P#** would get all reactions with π^-p as the initial state, regardless of the final state.

FIND **Part**icle "**UPSI(9460)**"

***Searching Problems:** If your search does not find any experiments, there are two common reasons why it may have failed spuriously. (1) You may have used an incorrect form for the value for which you were searching (e.g., an incorrect particle or experiment name). To find out the correct form, use the **BROWSE** command for the index you are searching (see above), or look in the lists of names and abbreviations given in the central section (colored pages) of this report. Note, in particular, that most antiparticle names are formed by preceding the particle name with the letter **A**; thus the antiproton is **AP** rather than **PBAR**. (2) Any search value containing any of the special characters () < > = must be enclosed in quotes; see the examples for **CITATION**, **REACTION**, and **PARTICLE** above.*

After entering a **FIND** command, you will be told the number of experiments satisfying the criteria given. At this point, you have several options: (1) You may list out the information available for these experiments (in the format shown on the inside front cover of this report) by typing:

TYPE (or **TYPE PA**Use if you are in line-by-line mode on a CRT terminal)

(To find out how to terminate a listing prematurely, see the note in the center of the previous page.)

Or (2) you may narrow down the list already found (i.e., add more selection criteria) by typing:

AND <index-name> <value>

Or (3) you may broaden the list already found (i.e., include more cases) by typing:

OR <index-name> <value>

Or (4) you may initiate a new search with a new **FIND** command, or issue any other command.

To switch to a briefer format (which does not list reactions and certain other information), type:

SET **FOR**mat **QUICKLIST**

To switch back to the complete format, type:

SET **FOR**mat **DEFAULT**

To terminate the session and log off the computer, type:

CP **LOG**off

LIST OF EXPERIMENTS AND TITLES

EXPERIMENT	TITLE
BNL-698	POLARIZED TARGET PHYSICS WITH THE MPS FOR STUDY OF STRANGE-PARTICLE REACTIONS
BNL-702	RADIATIVE DECAY $\Sigma^+ \rightarrow \Lambda^0 \gamma$ FROM POLARIZED Σ^+ HYPERONS
BNL-705	A SEARCH FOR NARROW AND BROAD RESONANCES DECAYING INTO KSHORT KSHORT, LAMBDA ANTI-LAMBDA, LAMBDA KSHORT AND ANTI-LAMBDA KSHORT FROM $\pi^- p$ INTERACTIONS AT 20 GEV/C USING THE BNL MPS
BNL-708	SEARCH FOR GAMMA TRANSITIONS IN $\bar{p} p$ ANNIHILATIONS AT REST AND LOW ENERGIES
BNL-722	FURTHER SEARCH FOR EXOTIC SIX-QUARK STATES
BNL-723	A PRECISION MEASUREMENT OF THE MAGNETIC MOMENT OF THE NEGATIVE SIGMA HYPERON BY THE EXOTIC ATOMS TECHNIQUE
BNL-726	SEARCH FOR CHARM IN HADRONIC INTERACTIONS NEAR THRESHOLD
BNL-732	SEARCH FOR THE η'/c
BNL-734	A MEASUREMENT OF THE ELASTIC SCATTERING OF NEUTRINOS FROM ELECTRONS AND PROTONS
BNL-735	TRANSVERSE MUON POLARIZATION IN $K^+ \rightarrow \mu^+ \pi^0 \nu$ DECAYS; AN EXPERIMENTAL TEST OF TIME REVERSAL INVARIANCE
BNL-737	STUDY OF NEUTRINO INTERACTIONS IN DEUTERIUM
BNL-742	SEARCH FOR THE S MESON IN THE TOTAL, ELASTIC, AND ANNIHILATION $\bar{p} p$ CROSS SECTIONS
BNL-744	MEASUREMENT OF INCLUSIVE Σ^0 PRODUCTION RATE AND POLARIZATION IN THE REACTION $p + Be \rightarrow \Sigma^0 + X$
BNL-745	AN IMPROVED TEST OF QED -- AN EXPERIMENT TO MEASURE VACUUM POLARIZATION IN THE 3D-3P TRANSITIONS IN MUONIC HELIUM
BNL-746	SPIN AND ISOSPIN EFFECTS IN LIGHT HYPERNUCLEI
BNL-747	A HIGH STATISTICS STUDY OF ϕ AND ϕ' PRODUCTION FROM $\pi^- p$ AND $K^- p$ INTERACTIONS AT 22 GEV/C -- A SEARCH FOR GLUEBALLS
BNL-748	POLARIZATION IN pp ELASTIC SCATTERING AT MEDIUM AND HIGH pt^2 FROM 15 TO 28.5 GEV/C
BNL-749	A MEASUREMENT OF MILLIWEAK CP VIOLATION IN KL - KS DECAYS THROUGH THE DETERMINATION OF EPSILON-PRIME
BNL-751	MEASUREMENT OF HYPERON RADIATIVE DECAY
BNL-752	A SEARCH FOR SIGMA HYPERNUCLEAR LEVELS IN $O(16)$ IN THE (K^-, π^+) REACTION
BNL-754	DETERMINATION OF THE DYNAMICS OF μ^+ MOTION IN ALUMINUM
BNL-755	$\pi^- p$ TWO-BODY EXCLUSIVE REACTIONS AT 90 DEG FROM 8 GEV/C TO 18 GEV/C, AND (PHASE II) LARGE ANGLE EXCLUSIVES -- POSITIVES AND POLARIZATION
BNL-758	THE (π^+, K^+) REACTION -- A NEW TOOL FOR THE STUDY OF HYPERNUCLEAR STRUCTURE
BNL-759	THE WEAK DECAY MODES OF HYPERNUCLEI
BNL-760	SPIN DEPENDENCE OF THE LAMBDA NUCLEUS INTERACTION DETERMINED BY OBSERVATION OF HYPERNUCLEAR GAMMA RAYS
BNL-762	SEARCH FOR NARROW STRUCTURES IN THE $\bar{p} p$ ANNIHILATION CROSS SECTION FROM 1900 TO 1950 MEV
BNL-766	DEVELOPMENT OF THE HARDWARE PROCESSOR TECHNIQUE. STUDY OF Ω^- PRODUCTION AND SPIN. STUDY OF $n p \rightarrow \text{ALL CHARGED}$.
BNL-767	DEVELOPMENT OF A LOW ENERGY ANTINEUTRON SOURCE AND MEASUREMENT OF $\bar{n} p$ ANNIHILATION CROSS SECTIONS NEAR ANTINEUTRON-NUCLEON THRESHOLD
BNL-769	SEARCH FOR GLUEBALLS AND OTHER MESON STATES
BNL-771	STUDY OF E-MESON CHARACTERISTICS IN $\pi^- p$, $K^- p$, AND $\bar{p} p$ INTERACTIONS
BNL-772	SEARCH FOR $\bar{p} p$ -NEUTRON BOUND AND RESONANT STATES
BNL-773	SEARCH FOR $S=-1$ DIBARYON STATE IN THE LAMBDA p MISSING MASS SPECTRUM NEAR THE SIGMA NUCLEON THRESHOLD IN THE REACTION $D(K^-, \pi^-) \Lambda p$
BNL-774	SEARCH FOR SIGMA HYPERNUCLEAR LEVELS IN He^4
BNL-775	NEUTRINO OSCILLATION EXPERIMENTS AT THE AGS TO COVER THE INTERVAL $0.1 < \Delta^2 \sin^2(\alpha) < 100 \text{ EV}^2$
BNL-776	NEUTRINO OSCILLATION EXPERIMENT AT BNL
BNL-777	SEARCH FOR THE RARE DECAY MODE $K^+ \rightarrow \pi^+ \mu^+ e^-$
BNL-778	STUDY OF NUCLEAR FRAGMENTS PRODUCED FROM p NUCLEUS COLLISIONS IN THE THRESHOLD REGION $1 < p < 28 \text{ GEV/C}$ USING A WARM GAS JET INTERNAL TARGET
BNL-779	USE OF 28-GEV PROTON EXTERNAL BEAM FOR NUCLEAR SPECTROSCOPY AND NUCLEAR REACTION STUDIES
BNL-780	A SEARCH FOR THE FLAVOR CHANGING NEUTRAL CURRENTS $K^0 \rightarrow \mu^0 \nu$ AND $K^0 \rightarrow e^+ e^- \nu$
BNL-781	SPIN DEPENDENCE OF THE LAMBDA NUCLEUS INTERACTION DETERMINED BY OBSERVATION OF HYPERNUCLEAR GAMMA RAYS
BNL-782	SPIN-SPIN EFFECTS IN MEDIUM AND HIGH MOMENTUM TRANSFER ELASTIC $p p$ SCATTERING
BNL-785	SINGLE SPIN ASYMMETRY MEASUREMENT IN INCLUSIVE $p(\text{POLARIZED}) p$ REACTIONS AT 24 GEV/C AT HIGH TRANSVERSE MOMENTUM
BNL-787	A STUDY OF THE DECAY $K^+ \rightarrow \pi^+ \nu \mu^+ \bar{\nu}$
BNL-788	THE FOUR-FERMION WEAK INTERACTION AND THE DECAY OF LAMBDA- He^4 AND LAMBDA- He^5
BNL-789	SEARCH FOR $\chi(2.22)$ FORMATION IN $\bar{p} p$ INTERACTIONS
BNL-790	NUCLEAR STOPPING POWER MEASUREMENTS WITH 18-GEV/C PROTONS
BNL-791	STUDY OF VERY RARE K-LONG DECAYS
CERN-IS-010	DETERMINATION OF THE ELECTRON NEUTRINO MASS FROM EXPERIMENTS ON ELECTRON-CAPTURE BETA DECAY (EC)
CERN-LEP-ALEPH	THE ALEPH DETECTOR
CERN-LEP-DELPHI	DELPHI
CERN-LEP-L3	L3 EXPERIMENT
CERN-LEP-OPAL	OPAL COLLABORATION LEP
CERN-NA-001	MEASUREMENT OF THE PHOTOPRODUCTION OF VECTOR AND SCALAR BOSONS
CERN-NA-002	ELECTROMAGNETIC INTERACTIONS OF MUONS
CERN-NA-003	DIRECT PHOTON PRODUCTION IN HADRON-HADRON COLLISIONS AT THE SPS.
CERN-NA-004	INCLUSIVE DEEP INELASTIC MUON SCATTERING
CERN-NA-005	A STUDY OF HARD HADRON-HADRON COLLISIONS WITH A STREAMER CHAMBER VERTEX SPECTROMETER AND A CALORIMETER TRIGGER
CERN-NA-006	NEUTRON ELASTIC SCATTERING AT VERY SMALL ANGLES
CERN-NA-007	MEASUREMENT OF THE ELECTROMAGNETIC FORM FACTORS OF π AND K MESONS AT THE SPS
CERN-NA-008	HADRON ELASTIC SCATTERING AT SMALL ANGLES
CERN-NA-009	STUDY OF FINAL STATES IN DEEP INELASTIC MUON SCATTERING
CERN-NA-010	HIGH RESOLUTION STUDY OF THE INCLUSIVE PRODUCTION OF MASSIVE MUON PAIRS BY INTENSE PION BEAMS
CERN-NA-011	MEASUREMENT OF CHARMED PARTICLE PRODUCTION IN HADRONIC REACTIONS
CERN-NA-012	STUDY OF $\pi^- p$ INTERACTIONS WITH NEUTRAL FINAL STATES
CERN-NA-014	PHOTOPRODUCTION AT HIGH ENERGY AND HIGH INTENSITY
CERN-NA-014-2	A PROGRAM OF HEAVY FLAVOR PHOTOPRODUCTION
CERN-NA-016	STUDY OF THE HADRONIC PRODUCTION AND PROPERTIES OF NEW PARTICLES WITH A LIFETIME $10^{-13} \text{ S} < \tau < 10^{-10} \text{ S}$ USING LEBE-EHS
CERN-NA-017	MOMENTUM AND ANGULAR CORRELATIONS STUDY IN π^- NUCLEI JETS AT HIGH ENERGIES USING AN EMULSION TELESCOPE TECHNIQUE WITH MAGNETIC FIELD
CERN-NA-018	SEARCH FOR SHORT-LIVED PARTICLES PRODUCED ON NUCLEI WITH A HEAVY LIQUID MINI BUBBLE CHAMBER
CERN-NA-019	DIRECT OBSERVATION OF BEAUTY PARTICLES SELECTED BY MUONIC DECAY IN EMULSION
CERN-NA-020	MEASUREMENTS OF π^+ , π^- , K^+ , K^- , p , AND \bar{p} YIELDS IN 400 GEV PROTON BERYLLIUM AND COPPER COLLISIONS
CERN-NA-022	THE INFLUENCE OF PARTON STRUCTURE ON HADRONIC INTERACTIONS IN EHS WITH A $K^+/\pi^+/\bar{p}$ BEAM AT 250 GEV/C
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CERN-NA-025	STUDY OF CHARM AND BOTTOM PARTICLE PRODUCTION USING A HOLOGRAPHIC BUBBLE CHAMBER
CERN-NA-027	AN EXPERIMENT TO MEASURE ACCURATELY THE LIFETIME OF THE D_0 , D_+ , D^- , F_+ , F^- , Λ /C CHARM PARTICLES AND TO STUDY THEIR HADRONIC PRODUCTION AND DECAY PROPERTIES
CERN-NA-028	STUDY OF SHADOWING AND HADRON PRODUCTION IN HIGH ENERGY MUON SCATTERING USING NUCLEAR TARGETS
CERN-NA-029	STUDY OF P_1^- P_1^0 PRODUCTION VIA THE PRIMAKOFF EFFECT ON NUCLEI
CERN-NA-030	PRECISION DETERMINATION OF THE LIFETIME OF THE NEUTRAL PION
CERN-NA-031	MEASUREMENT OF THE RATIO $\langle \eta^2 \rangle / \langle \eta^+ \eta^- \rangle$
CERN-NA-032	INVESTIGATION OF CHARM PRODUCTION IN HADRONIC INTERACTIONS USING HIGH-RESOLUTION SILICON DETECTORS
CERN-NA-033	AN EXPERIMENTAL STUDY OF SINGLE-VERTEX ($e^- e^+$) PAIR CREATION IN A CRYSTAL
CERN-NA-034	LEPTON PRODUCTION
CERN-PS-157	HIGH PRECISION MEASUREMENT OF P_1^- P TOTAL CROSS SECTION
CERN-PS-159	STRANGE DIBARYON SYSTEMS
CERN-PS-160	MEASUREMENT OF A AND R PARAMETERS IN THE REACTION $P_1^+ P \rightarrow K^+ \Sigma^+$
CERN-PS-161	SEARCH FOR STRONGLY BOUND STATES OF THE ANTI-PROTON-PROTON, ANTI-PROTON-DEUTERON, AND ANTI-PROTON-FEW-NUCLEON STATES
CERN-PS-162	STUDY OF THE STRUCTURE OF EXOTIC LIGHT NUCLEI PRODUCED AT THE PS
CERN-PS-163-2	MEASUREMENT OF THE $P_{BAR} P$ EXCITATION FUNCTION
CERN-PS-164	THE INFLUENCE OF CHANNELLING ON ATOMIC AND NUCLEAR REACTION YIELDS
CERN-PS-165	MEASUREMENT OF THE K^- P SCATTERING LENGTH AT THRESHOLD BY OBSERVATION OF KAONIC HYDROGEN X-RAYS FROM A CONDENSED TARGET
CERN-PS-166	SEARCH FOR SIGMA HYPERNUCLEAR STATES USING THE STRANGENESS EXCHANGE REACTIONS (K^- , P_1^-) AND (K^- , P_1^+)
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CERN-PS-169	SEARCH FOR NEUTRINO OSCILLATIONS
CERN-PS-170	PRECISION MEASUREMENTS OF THE PROTON ELECTROMAGNETIC FORM FACTORS IN THE TIME-LIKE REGION AND VECTOR MESON SPECTROSCOPY
CERN-PS-171	A STUDY OF $P_{BAR} P$ INTERACTIONS AT REST IN A H_2 GAS TARGET AT LEAR
CERN-PS-172	$P_{BAR} P$ TOTAL CROSS SECTIONS AND SPIN EFFECTS IN $P_{BAR} P \rightarrow K^+ K^-$, $P_1^+ P_1^-$, $P_{BAR} P$ ABOVE 200 MEV/C
CERN-PS-173	MEASUREMENT OF $P_{BAR} P$ CROSS SECTIONS AT LOW P_{BAR} MOMENTA
CERN-PS-174	PRECISION SURVEY OF X-RAYS FROM $P_{BAR} P$ ($P_{BAR} D$) ATOMS USING THE INITIAL LEAR BEAM
CERN-PS-175	MEASUREMENT OF THE ANTI-PROTONIC LYMAN AND BALMER X-RAYS OF $P_{BAR} H$ AND $P_{BAR} D$ ATOMS AT VERY LOW TARGET PRESSURES
CERN-PS-176	STUDY OF X-RAY AND GAMMA-RAY SPECTRA FROM ANTI-PROTONIC ATOMS AT THE SLOWLY EXTRACTED ANTI-PROTON BEAM OF LEAR
CERN-PS-177	A SEARCH FOR HEAVY HYPERNUCLEI AT LEAR
CERN-PS-178	ANTI-NEUTRON PRODUCTION AT LEAR
CERN-PS-179	STUDY OF THE INTERACTION OF LOW-ENERGY ANTI-PROTONS WITH H_2 , HE_3 , HE_4 , AND NE NUCLEI USING A STREAMER CHAMBER IN A MAGNETIC FIELD
CERN-PS-180	SEARCH FOR NEUTRINO OSCILLATIONS AT CERN PS USING BEBC
CERN-PS-181	CONTRIBUTION OF THE CHARM COLLABORATION TO THE CERN NEUTRINO OSCILLATION PROGRAM
CERN-PS-182	INVESTIGATIONS ON BARYONIUM AND OTHER RARE $P_{BAR} P$ ANNIHILATION MODES USING HIGH-RESOLUTION P_1^0 SPECTROMETERS
CERN-PS-183	SEARCH FOR BOUND $N_{BAR} N$ STATES USING A PRECISION GAMMA AND CHARGED PION SPECTROMETER AT LEAR
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CERN-PS-188	MEASUREMENTS OF CHANNELLING RADIATION AND ITS POLARIZATION, X-RAY EXCITATION, TOGETHER WITH DEVIATIONS FROM LANDAU DISTRIBUTIONS
CERN-PS-189	HIGH PRECISION MASS MEASUREMENTS WITH A RADIOFREQUENCY MASS SPECTROMETER -- APPLICATION TO THE MEASUREMENT OF THE PROTON-ANTI-PROTON MASS DIFFERENCE
CERN-PS-191	SEARCH FOR DECAYS OF HEAVY NEUTRINOS WITH THE PS BEAM
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CERN-R-420	STUDY OF $LN(S)$ PHYSICS IN $P_{BAR} P$ INTERACTIONS AT THE SPLIT FIELD MAGNET
CERN-R-421	STUDY OF PROTON-PROTON AND PROTON-ANTI-PROTON COLLISIONS AT THE SFM FACILITY OF THE CERN ISR
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CERN-R-608	LARGE-X HADRON PHYSICS AND CORRELATIONS WITH CENTRAL REGION PHENOMENA
CERN-R-703	EVALUATION OF A LARGE STREAMER CHAMBER DETECTION SYSTEM AND A STUDY OF ANTI-PROTON-PROTON PROTON-PROTON DIFFERENCES AT ISR ENERGIES
CERN-R-704	CHARMONIUM SPECTROSCOPY AT THE ISR USING AN ANTI-PROTON BEAM AND A HYDROGEN JET TARGET
CERN-R-806	STUDY OF LARGE TRANSVERSE MOMENTUM PHENOMENA
CERN-R-807	A STUDY OF LARGE TRANSVERSE MOMENTUM PHENOMENA
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CERN-SC-077	DETERMINATION OF THE BRANCHING RATIO FOR THE DECAY $P_1^0 \rightarrow e^+ e^-$
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CERN-UA-001	A 4PI SOLID ANGLE DETECTOR FOR THE SPS USED AS A PROTON-ANTI-PROTON COLLIDER AT A C.M. ENERGY OF 540 GEV
CERN-UA-002	STUDY OF ANTI-PROTON-PROTON INTERACTIONS AT 620-GEV C.M. ENERGY
CERN-UA-003	SEARCH FOR MAGNETIC MONOPOLES AT THE ANTI- $P P$ COLLIDING RING
CERN-UA-004	MEASUREMENT OF ELASTIC SCATTERING AND OF TOTAL CROSS SECTION AT THE CERN ANTI- $P P$ COLLIDER
CERN-UA-005	INVESTIGATION OF PROTON-ANTI-PROTON EVENTS AT 540-GEV C.M. ENERGY WITH A STREAMER CHAMBER DETECTION SYSTEM
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CERN-WA-001	HIGH-ENERGY NEUTRINO INTERACTIONS
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CERN-WA-006	POLARIZATION IN $P P$ AND $P_1 P$ ELASTIC SCATTERING
CERN-WA-007	TWO-BODY REACTIONS AT LARGE TRANSVERSE MOMENTUM
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CERN-WA-018-2	HIGH-PRECISION MEASUREMENT OF THE RATIO $\sigma_{\text{NU(NC)}}/\sigma_{\text{NU(CC)}}$
CERN-WA-021	HIGH ENERGY NU AND ANTI-NU INTERACTIONS IN BEBC FILLED WITH H ₂
CERN-WA-025	NEUTRINO AND ANTINEUTRINO INTERACTIONS IN DEUTERIUM
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CERN-WA-028	K ⁻ P INTERACTIONS IN BEBC AT 110-GEV/C
CERN-WA-038	MAGNETIC MONOPOLE SEARCH AT THE SPS
CERN-WA-042	AN EXPERIMENT ON THE STRONG INTERACTIONS AND RADIATIVE DECAYS OF HYPERONS
CERN-WA-044	SEARCH FOR QUARKS IN HIGH-ENERGY NEUTRINO INTERACTIONS
CERN-WA-047	CONTINUATION OF THE STUDY OF NEUTRINO INTERACTIONS WITH DICHROMATIC BEAMS AT THE SPS, USING BEBC FILLED WITH NEON
CERN-WA-056	STUDY OF N ANTI-N STATES PRODUCED VIA BARYON EXCHANGE IN π^+ P INTERACTIONS USING THE OMEGAPRIME SPECTROMETER
CERN-WA-058	MEASUREMENT OF THE LIFETIME OF CHARMED PARTICLES IN NUCLEAR EMULSION EXPOSED TO AN 80 GEV BREMSSTRAHLUNG BEAM IN CONJUNCTION WITH THE OMEGA PRIME SPECTROMETER
CERN-WA-059	MEASUREMENT OF NUCLEON STRUCTURE FUNCTIONS IN HORN FOCUSED NEUTRINO AND ANTI-NEUTRINO BEAMS IN BEBC FILLED WITH NEON
CERN-WA-062	SEARCH FOR THE CHARMED STRANGE BARYON Λ_0
CERN-WA-063	INCLUSIVE BARYON-ANTIBARYON PRODUCTION IN THE CENTRAL REGION USING THE OMEGA SPECTROMETER
CERN-WA-064	CHANNELLING RADIATION IN A SILICON CRYSTAL
CERN-WA-065	FURTHER STUDIES OF PROMPT NEUTRINO PRODUCTION IN 400 GEV PROTON NUCLEUS COLLISIONS
CERN-WA-066	FURTHER STUDY OF PROMPT NEUTRINO PRODUCTION IN PROTON-NUCLEUS COLLISIONS USING BEBC
CERN-WA-067	STUDY OF π^- P INTERACTIONS AT 85 GEV/C LEADING TO $K^+K^+K^-$ IN THE FINAL STATE -- SEARCH FOR NEW STATES
CERN-WA-068	FURTHER STUDY OF PROMPT NEUTRINO PRODUCTION IN A PROTON BEAM DUMP EXPERIMENT
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CERN-WA-076	STUDY OF THE MESONS PRODUCED CENTRALLY IN THE REACTION $P P \rightarrow P P + X_0$ AND $\pi^+ P \rightarrow \pi^+ P + X_0$ AT 85 GEV/C
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FNAL-326	A PROPOSAL TO MEASURE MUON PAIRS PRODUCED AT HIGH INVARIANT MASS BY PIONS
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FNAL-458	PHOTOPRODUCTION EXPERIMENT AT FERMILAB
FNAL-466	STUDY OF HIGH-ENERGY REACTION MECHANISMS BY THE MEASUREMENT OF THE ANGULAR AND ENERGY DISTRIBUTIONS OF NUCLEI RECOILING FROM TARGETS BOMBARDED WITH 200-300 GEV PROTONS
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FNAL-524	PROPOSAL TO STUDY PROTON-NUCLEUS INTERACTIONS IN EMULSION PLATES WITH EMBEDDED METAL POWDER GRANULES AT HIGHEST AVAILABLE ENERGY (> 400 GEV)
FNAL-531	A PROPOSAL TO STUDY WEAK DECAY LIFETIMES OF NEUTRINO PRODUCED PARTICLES IN A TAGGED EMULSION SPECTROMETER
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FNAL-549	A SEARCH FOR FRACTIONAL CHARGES USING ACCELERATOR AND LOW TEMPERATURE TECHNIQUES
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FNAL-555	A PROPOSAL TO STUDY CROSS SECTIONS AND POLARIZATION IN NEUTRAL STRANGE PARTICLE PRODUCTION AT HIGH TRANSVERSE MOMENTUM
FNAL-557	STUDY OF HADRON JETS WITH THE CALORIMETER TRIGGERED MULTIPARTICLE SPECTROMETER
FNAL-564	DIRECT DETECTION OF SHORT-LIVED PARTICLES FROM NEUTRINO INTERACTIONS IN NUCLEAR EMULSIONS INSIDE THE 15-FOOT BUBBLE CHAMBER
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FNAL-576	500 GEV PROTON INTERACTIONS IN NUCLEAR EMULSION
FNAL-577	PROPOSAL TO MEASURE $\pi^+ p$ ELASTIC SCATTERING AT LARGE ANGLES
FNAL-580	A SEARCH FOR NARROW AND BROAD RESONANCES DECAYING INTO Λ -ALAMBDA, Λ -ALAMBDA- π , $K(\text{SHORT})$ - $K(\text{SHORT})$ AND $K(\text{SHORT})$ - $K(\text{SHORT})$ - π FROM $\pi^- p$ INTERACTIONS AT 200-GEV/C USING THE FERMILAB MPS
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FNAL-594	PROPOSAL FOR A NEW NEUTRINO DETECTOR AT FERMILAB
FNAL-595	A STUDY OF CHARM AND PROMPT SINGLE MUON PRODUCTION IN PROTON-NUCLEON AND PION-NUCLEON COLLISIONS
FNAL-597	PROPOSAL FOR A HIGH STATISTICS STUDY OF PBAR P ANNIHILATIONS AND A COMPARISON OF PBAR, P, PI-, PI+, AND K+ INTERACTIONS ON HYDROGEN, MAGNESIUM, SILVER, AND GOLD AT 100-GEV/C UTILIZING THE FERMILAB 30-INCH HYDROGEN BUBBLE CHAMBER AND DOWNSTREAM PARTICLE IDENTIFIER
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FNAL-617	A STUDY OF DIRECT CP VIOLATION IN THE DECAY OF THE NEUTRAL KAON VIA A PRECISION MEASUREMENT OF ABS(ETA00/ETA+-)
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FNAL-630	STUDY OF B PARTICLE AND CHARMED PARTICLE PRODUCTION AND DECAY USING A HIGH RESOLUTION STREAMER CHAMBER
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FNAL-740	A STUDY OF PROTON ANTIPROTON COLLISION USING A LARGE DETECTOR AT D-0
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ITEP-E-802	STUDY OF K+ INTERACTIONS WITH XENON
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ITEP-E-812	STUDY OF CUMULATIVE PARTICLE PRODUCTION IN PION NUCLEUS INTERACTIONS
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ITEP-E-822	SEARCH FOR BOUND AND RESONANT STATES IN THE TWO-LAMBDA SYSTEM
ITEP-E-823	MEASUREMENT OF COULOMB-NUCLEAR INTERFERENCE IN π^+ - NUCLEI SCATTERING
ITEP-E-831	MEASUREMENT OF π^- , π^+ , P, H2, H3, AND HE3 INCLUSIVE CROSS SECTIONS IN PROTON INTERACTIONS WITH BE, AL, CU, AND TA NUCLEI IN THE ENERGY RANGE 3.7 TO 9.2 GEV
KEK-TE-001	TRISTAN E+ E- EXPERIMENTS BY VENUS COLLABORATION
KEK-TE-002	STUDY OF ELECTRON-POSITRON ANNIHILATION PHENOMENA BY A DETECTOR WITH PARTICLE IDENTIFICATION
KEK-TE-003	AMY -- A HIGH RESOLUTION LEPTON DETECTOR FOR TRISTAN
KEK-010	SEARCH FOR RARE DECAY MODES K+ \rightarrow π^+ NU ANU, K+ \rightarrow π^+ 2GAMMA, AND K+ \rightarrow π^+ AXION
KEK-034	MEASUREMENT OF THE POLARIZATION FOR THE REACTIONS K+ N \rightarrow K+ N, KO P AT 1.06, 1.28, 1.39, AND 1.49 GEV/C
KEK-049	PRODUCTION OF POLARIZED LAMBDA PARTICLES AND THEIR BETA DECAYS
KEK-057	STUDIES OF P P INTERACTIONS IN THE MOMENTUM RANGE 0.9-2.0 GEV/C
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KEK-074	SEARCH FOR BARYONIUM STATES IN ANTIPROTON-NUCLEON INTERACTIONS
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KEK-075	MEASUREMENTS OF POLARIZATION PARAMETERS IN ELASTIC PROTON-NEUTRON SCATTERING
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KEK-080	STUDY OF DEUTERIUM-PROTON REACTIONS FROM 2.0 TO 4.0 GEV/C
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LAMPF-032	PRECISION MEASUREMENT OF THE PROCESSES π^+ \rightarrow π^0 E- NU
LAMPF-058-120	MEASUREMENT OF π^- P \rightarrow GAMMA N, AND MEASUREMENT OF THE POLARIZATION ASYMMETRY AND THE DIFFERENTIAL CROSS SECTION OF PION NUCLEON CHARGE EXCHANGE FROM 160 TO 500 MEV
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LAMPF-336	STUDY OF THE SPIN DEPENDENCE OF PROTON-PROTON PION PRODUCTION REACTIONS
LAMPF-360	THE MEASUREMENT OF THE POLARIZATION TRANSFER COEFFICIENTS D/T AND A'/T AT 800 MEV FOR THE REACTIONS D(P,N)2P, L16(P,N)BE6, AND BE9(P,N)B9
LAMPF-366	NONRESONANT PION PRODUCTION IN THE REACTION N P \rightarrow π^- P P
LAMPF-385	MEASUREMENT OF THE POLARIZED P N ANALYZING POWER, A/Y(THETA), FROM 10-70 DEG THETA C.M.
LAMPF-392	A MEASUREMENT OF THE TRIPLE-SCATTERING PARAMETERS D, R, A, R', AND A' FOR PROTON-PROTON AND PROTON-NEUTRON SCATTERING AT 800 MEV
LAMPF-400-445	STUDY OF π^0 \rightarrow 3 GAMMA AND π^+ \rightarrow E+ GAMMA NEUTRINO DECAYS, AND SEARCH FOR LEPTON FLAVOR-VIOLATING DECAYS μ^+ \rightarrow E+ E- E-, μ^+ \rightarrow E+ 2 GAMMA, AND μ^+ \rightarrow E+ GAMMA
LAMPF-402	A MEASUREMENT OF THE POLARIZATION TRANSFER COEFFICIENTS D/T(0 DEG) AND A'/T(0 DEG) IN THE REACTION P P \rightarrow N X AT 800 MEV
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LAMPF-421	SENSITIVE SEARCH FOR μ^- \rightarrow E- CONVERSION
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LAMPF-455	HIGH-PRECISION STUDY OF THE μ^+ DECAY SPECTRUM
LAMPF-457	MEASUREMENT OF THE QUASI-FREE P N AND P P AND FREE P P ANALYZING POWERS, 500-800 MEV
LAMPF-462	ANALYZING POWER AND DIFFERENTIAL CROSS SECTIONS FOR THE REACTIONS P P \rightarrow D π^+ AND P D \rightarrow T π^+ AT ABOUT 600 MEV AND 400 MEV
LAMPF-478	π^+ AND π^- ELASTIC SCATTERING FROM DEUTERIUM
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LAMPF-504	MEASUREMENT OF THE TOTAL CROSS SECTION DIFFERENCE FOR PROTON-PROTON SCATTERING IN PURE TRANSVERSE INITIAL SPIN STATES IN THE 400-800 MEV REGION
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LAMPF-517	POLARIZED BEAM AND TARGET EXPERIMENTS IN THE P P SYSTEM. PHASE I. A/Y AND A'/Y FOR THE D π^+ CHANNEL AND A'/Y FOR THE ELASTIC CHANNEL FROM 500 TO 800 MEV

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LAMPF-546	INVESTIGATION OF THE SPIN FORM FACTOR OF TRITIUM AND HELIUM-THREE
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LAMPF-567	A STUDY OF THE PI+ D ---> P P REACTION AT PION ENERGIES 5-200 MEV
LAMPF-581	PI+- ELASTIC SCATTERING FROM DEUTERIUM AT 256 MEV
LAMPF-585	MEASUREMENT OF P P AND P D ELASTIC SCATTERING IN THE COULOMB INTERFERENCE REGION BETWEEN 500 AND 800 MEV
LAMPF-589	FREE-FORWARD N P ELASTIC-SCATTERING ANALYZING POWER MEASUREMENTS AT 800 MEV
LAMPF-590	MEASUREMENT OF D(THETA) IN P N AND N P SCATTERING AT 800, 650 MEV AND OTHER ENERGIES WITH ASSOCIATED P P MEASUREMENTS
LAMPF-605	A DIBARYON SEARCH AT EPICS
LAMPF-634	MEASUREMENT OF PARITY VIOLATION IN THE P-NUCLEON TOTAL CROSS SECTIONS AT 800 MEV
LAMPF-635	SPIN MEASUREMENTS IN P D ELASTIC SCATTERING
LAMPF-636	A MEASUREMENT OF THE WOLFENSTEIN POLARIZATION PARAMETERS D/LL, D/SL, K/LL, AND K/SL FOR P P ELASTIC SCATTERING
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LAMPF-650	A SEARCH FOR NEUTRINO MIXING VIA NONEXPONENTIAL PI ---> MU NU DECAY
LAMPF-651	MEASUREMENT OF A LOWER LIMIT FOR THE SUBTHRESHOLD PRODUCTION OF KAONS WITH 800-MEV PROTONS
LAMPF-664	THE MEASUREMENT OF THE POLARIZATION TRANSFER COEFFICIENTS A'/T AND D/T AT 500, 650, AND 800 MEV FOR THE REACTION D(P,N)2P
LAMPF-665	THE MEASUREMENT OF THE INITIAL STATE SPIN CORRELATION PARAMETERS C/LL AND C/SL IN N P ELASTIC SCATTERING AT 500, 650, AND 800 MEV
LAMPF-682	SEARCH FOR DIBARYON RESONANCES IN THE REACTION PI D ---> P PI N AT PLAB 200 TO 600 MEV/C
LAMPF-683	MEASUREMENT OF DELTA-SIGMA/L IN FREE NEUTRON-PROTON SCATTERING AT 500, 650, AND 800 MEV
LAMPF-685	SPIN CORRELATIONS IN THE REACTION P(D,D)P AT 500 MEV
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LAMPF-758	TO CATCH A DEMON
LAMPF-764	SEARCH FOR NEUTRINO OSCILLATIONS AND MEASUREMENTS OF CROSS SECTIONS USING A LIQUID SCINTILLATOR DETECTOR IN A MUON NEUTRINO BEAM AT THE LINE D STUB
LAMPF-767	PI+- DEUTERON ELASTIC SCATTERING AT THREE ENERGIES BETWEEN 30 AND 80 MEV
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LAMPF-790	I=1 N N INELASTIC CROSS SECTIONS AND FIRST MEASUREMENTS OF T20 FOR THE P P ---> D PI+ REACTION AT 800 AND 650 MEV
LAMPF-792	MEASUREMENT OF PARITY VIOLATION IN THE P-P AND P-NUCLEON TOTAL CROSS SECTIONS AT 800 MEV
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LAMPF-804	MEASUREMENT OF THE ASYMMETRY PARAMETER IN PI- P ---> GAMMA N USING A TRANSVERSE POLARIZED TARGET
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LAMPF-825	INVESTIGATION OF THE N-DELTA INTERACTION VIA PI+ D ---> P PI+ N
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LAMPF-849	A MEASUREMENT OF THE DIFFERENTIAL CROSS SECTION FOR PI- P ---> PI0 N AT 0 DEGREES AND 180 DEGREES IN THE MOMENTUM REGION 471-687 MEV/C
LAMPF-853	MEASUREMENT OF WOLFENSTEIN PARAMETERS AT 650 AND DSIGMA/DOMEGA AT 500, 650, AND 800 MEV FOR P D ---> P D ELASTIC SCATTERING
LAMPF-861	MEASUREMENTS OF THE SPIN-CORRELATION PARAMETER ANN(THETA) FOR N P ELASTIC SCATTERING AT 800 MEV
LAMPF-869	HIGHER PRECISION MEASUREMENT OF THE LAMB SHIFT IN MUONIUM
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LENI-SC-029	MULTIPARAMETER INVESTIGATIONS OF FRAGMENT KINEMATICS WHEN DESTROYING NUCLEI BY PROTONS WITH ENERGY 1 GEV USING A DOUBLE-ARM TIME-OF-FLIGHT MASS SPECTROMETER
LENI-SC-042	STUDY OF MULTIPARTICLE DISINTEGRATION OF NUCLEI BY FAST HADRONS
LENI-SC-052	QUASIFREE PROTON SCATTERING AT ENERGY 1 GEV
LENI-SC-056	MEASUREMENT OF ENERGY AND ANGULAR DEPENDENCE OF THE CORRELATION COEFFICIENT OF POLARIZATION C(NN) IN ELASTIC PROTON-PROTON SCATTERING AT ENERGIES 690-950 MEV
LENI-SC-062	STUDY OF DIFFERENTIAL CROSS SECTIONS FOR PI+ DEUT ---> P P IN THE DIBARYON RESONANCES REGION
LENI-SC-066	STUDY OF CUMULATIVE NEUTRON PRODUCTION FROM NUCLEI BY PROTONS WITH ENERGY 1 GEV
LENI-SC-078	EXPERIMENTAL DISCOVERY OF SPATIAL CAPTURE EFFECT BY A MONOCRYSTAL IN THE CHANNELING REGIME
LENI-SC-085	MEASUREMENT OF CUMULATIVE PROTON POLARIZATION
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LENI-SC-108	STUDY OF BACKWARD PROTON SPECTRA IN THE REACTION P DEUT ---> P P N IN THE ENERGY REGION 500-1000 MEV
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P-DECAY-HPW	THE HARVARD-PURDUE-WISCONSIN EXPERIMENT
P-DECAY-IMB	THE IRVINE-MICHIGAN-BROOKHAVEN EXPERIMENT
P-DECAY-KAMIOKA	THE KAMIOKA EXPERIMENT
P-DECAY-KGF	THE KOLAR GOLD FIELD EXPERIMENT
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SACLAY-038	D-P ELASTIC SCATTERING AS A SOURCE OF INFORMATION ABOUT THE DEUTERON D-WAVE AND THE SPIN STRUCTURE OF THE N-N AMPLITUDES
SACLAY-050	STUDY OF THE DIBARYONIC COMPONENT (Δ^{++} , 2N) AND EVENTUALLY DIBARYONIC ($T=1$) IN HE3 USING THE TRANSFER REACTIONS HE3(P,T), HE3(P,D), AND P(HE3,D).
SACLAY-051	P-D AND P-HE3 ELASTIC SCATTERING BETWEEN 140 AND 180 DEGREES CM
SACLAY-052	STUDY OF NUCLEON-NUCLEON SCATTERING AT SATURNE II
SACLAY-052-2	MEASUREMENT OF P P ELASTIC SCATTERING IN THE COULOMB-NUCLEAR INTERFERENCE REGION USING THE POLARIZED PROTON BEAM FROM SATURNE II
SACLAY-057	SEARCH FOR BARYONIUM STATES NEAR THE N-NBAR THRESHOLD BY THE DETECTION OF RECOIL NUCLEI WITH SPES-IV
SACLAY-060	ANGULAR AND ENERGY DEPENDENCE OF THE CROSS SECTION AND THE ANALYZING POWER OF THE REACTION P P \rightarrow D PI+ BETWEEN 725 AND 1000 MEV
SACLAY-066	MEASUREMENT OF THE THE D D \rightarrow HE GAMMA REACTION FOR A TEST OF THE MICROSCOPIC REVERSIBILITY PRINCIPLE
SACLAY-068	STUDY OF REACTIONS P D \rightarrow HE3 P10, P D \rightarrow HE3 GAMMA, AND P D \rightarrow H3 PI+
SACLAY-070	SEARCH FOR DIBARYONIC RESONANCES IN P P ELASTIC SCATTERING BETWEEN 600 AND 1000 MEV
SACLAY-078	N P ELASTIC SCATTERING AT SMALL ANGLES
SACLAY-080	STUDY OF ISOSCALAR DIBARYONIC RESONANCES
SACLAY-085	THE (HE3, T) REACTION AT INTERMEDIATE ENERGIES
SACLAY-087	MEASUREMENT OF THE TOTAL CROSS SECTION DIFFERENCE $\Delta\sigma-L$ (P P) IN THE ENERGY RANGE FROM 0.52 TO 2.8 GEV
SACLAY-088	MEASUREMENT OF A(OOKK) FOR P P ELASTIC SCATTERING FROM 725 TO 1040 MEV
SACLAY-089	EXPERIMENTAL CONFIRMATION OF THE PHASE-SHIFT ANALYSIS PREDICTIONS IN THE DIBARYON REGION
SACLAY-092	COHERENT PRODUCTION OF PIONS IN THE REACTION HE3(HE3, PI+)LI6 AS A FUNCTION OF INCIDENT ENERGY
SACLAY-095	COHERENT PRODUCTION OF THE ETA IN THE BACKWARD DIRECTION IN P D AND D D SYSTEMS
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SACLAY-101	NOVEL TECHNIQUE FOR THE BEAM POLARIZATION MEASUREMENT AT HIGH ENERGIES
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SACLAY-105	TEST OF CHARGE SYMMETRY IN THE REACTION D D \rightarrow HE4 P10
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SERP-E-045	STUDY OF MUON CHARACTERISTICS IN NEUTRINO INTERACTIONS
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SERP-E-102	STUDY OF HYPERCHARGE EXCHANGE SCATTERING PROCESSES
SERP-E-104	SEARCH FOR CHARM
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SERP-E-130	LIQUID ARGON DETECTOR FOR HADRONS AND GAMMAS
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SERP-E-136	NEUTRINO DETECTOR
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SERP-E-139	STUDY OF ANTIDEUTERON-PROTON AND ANTIDEUTERON-DEUTERON INTERACTIONS IN LUMILLA
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SERP-E-147	STUDY OF REACTIONS WITH STRANGE PARTICLE PRODUCTION IN THE PI- MESON BEAM OF THE IHEP ACCELERATOR
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SERP-E-157	NEW RESONANCES SEARCH IN DIFFRACTIVE PROCESSES ON NUCLEI WITH THE MIS-2 DETECTOR
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SIN-R-72-02	EXPERIMENTS WITH NEUTRON BEAMS
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SIN-R-74-05	ELECTRON POLARIZATION IN MUON DECAY
SIN-R-75-07-2	MEASUREMENT OF THE P PARAMETER IN PI- P ELASTIC AND CHARGE EXCHANGE SCATTERING
SIN-R-77-01	STUDY OF ANGULAR CORRELATIONS IN THE REACTIONS C12(MU-, NU)B12 (G.S.)
SIN-R-78-05-4	MEASUREMENT OF THE AXZ PARAMETER IN THE REACTION P P \rightarrow PI+ D
SIN-R-78-06	MEASUREMENT OF THE REACTION P (POLARIZED) P (POLARIZED) \rightarrow PI+ D AT 580 MEV
SIN-R-78-09	SEARCH FOR ANOMALOUS MUON-NUCLEON INTERACTIONS; PRECISION MEASUREMENTS OF 2P-1S TRANSITIONS IN MUONIC LI7, C12, AND C13
SIN-R-78-13-1	STUDY OF THE RADIATIVE DECAY OF THE PION
SIN-R-78-15-1	MEASUREMENT OF THE 2P-2S ENERGY DIFFERENCE IN MUONIC HYDROGEN

LIST OF EXPERIMENTS AND TITLES

EXPERIMENT	TITLE
SIN-R-78-18	DETERMINATION OF THE VECTOR ANALYZING POWER IN π^0 SCATTERING
SIN-R-79-05	π^+ AND π^- ABSORPTION IN LIGHT NUCLEI
SIN-R-79-07	THE STUDY OF THE REACTION $\pi^+ d \rightarrow p p$ WITH A VECTOR POLARIZED D TARGET
SIN-R-80-01	MEASUREMENT OF CROSS SECTIONS WITH A BEAM OF POLARIZED PROTONS AND A POLARIZED TARGET
SIN-R-80-11	SEARCH FOR ADMIXTURE OF HEAVY NEUTRINOS IN π^+ \rightarrow μ^+ NUMU DECAY
SIN-R-81-01	EXPERIMENTAL DETERMINATION OF THE STRONG INTERACTION SHIFT IN THE 2P-1S TRANSITION OF PIONIC HYDROGEN AND DEUTERIUM ATOMS
SIN-R-81-02	STUDY OF THE FORMATION OF MUONIC ATOMS IN LOW Z GASEOUS MATERIALS IN A CYCLOTRON TRAP
SIN-R-81-06	IMPROVED DETECTION OF 2-GAMMA EVENTS FROM THE SIN BEAM DUMP AND MEASUREMENT OF THEIR INVARIANT MASS
SIN-R-81-09	SEARCH FOR HEAVY NEUTRINOS IN π^0 \rightarrow $e^+ e^-$ DECAY
SIN-R-82-01	SEARCH FOR AN ADMIXTURE OF HEAVY NEUTRINOS IN THE DECAY OF PIONS AT REST
SIN-R-82-03-1	MEASUREMENT OF THE LIFETIME OF THE 2S STATE OF MUONIC HELIUM AT GAS PRESSURES BELOW 5 ATM
SIN-R-82-04	PRECISE DETERMINATION OF THE BRANCHING RATIO $R = (\pi^0 \rightarrow e^+ e^- + \pi^0 \rightarrow e^+ e^- \gamma) / (\pi^0 \rightarrow \mu^+ \mu^- + \pi^0 \rightarrow \mu^+ \mu^- \gamma)$
SIN-R-82-06	SPIN TRANSFER PARAMETERS IN THE PROTON-PROTON INELASTIC CHANNELS
SIN-R-82-10	PRECISION DETERMINATION OF THE MASS OF THE NEGATIVE PION AND SEARCH FOR STRONG $\pi^0 n$ VAN DER WAALS FORCES
SIN-R-82-17	COULOMB-NUCLEAR INTERFERENCE IN $\pi^+ p$ AND $\pi^- p$ ELASTIC SCATTERING AT 55 MEV
SIN-R-83-20-2	MEASUREMENT OF THE 2S-2P ENERGY DIFFERENCE IN MUONIC HELIUM-4 AT LOW GAS DENSITY
SIN-R-83-29	MEASUREMENT OF THE XI PARAMETER IN MU DECAY
SIN-Z-75-02	PARITY VIOLATION IN $p p$ SCATTERING
SIN-Z-80-01	PARITY VIOLATION IN p ALPHA SCATTERING
SLAC-BC-072	STUDY OF CHARM PHOTOPRODUCTION IN THE SHF EXPOSED TO A POLARIZED MONO-ENERGETIC BACKSCATTERED LASER BEAM OF 20 GEV PHOTONS
SLAC-BC-073	MEASUREMENT OF LIFETIME AND OTHER PROPERTIES OF CHARMED PARTICLES
SLAC-BC-075	PROPOSAL FOR AN IMPROVED CHARM PHOTOPRODUCTION STUDY AT THE SLAC HYBRID FACILITY
SLAC-BC-076	AN EXPERIMENT TO STUDY Λ^0/c^+ DECAY MODES IN 10.5 GEV PHOTOPRODUCTION, WHERE A THRESHOLD ENHANCEMENT IS PREDICTED
SLAC-E-130	PRECISE MEASUREMENTS OF ASYMMETRIES IN DEEP INELASTIC SCATTERING OF POLARIZED ELECTRONS BY POLARIZED PROTONS AND BY POLARIZED DEUTERONS
SLAC-E-135	COMPARISON OF $K^- p$ AND $K^+ p$ INTERACTIONS, AND A PROGRAMMATIC STUDY OF STRANGE QUARK SPECTROSCOPY
SLAC-E-136	ELASTIC ELECTRON-PROTON CROSS SECTIONS AT LARGE MOMENTUM TRANSFER
SLAC-E-137	SEARCH FOR LOW MASS, METASTABLE NEUTRAL PARTICLES AT SLAC
SLAC-PEP-002	SEARCH FOR HIGHLY IONIZING PARTICLES AT PEP
SLAC-PEP-004	A PEP FACILITY BASED ON THE TIME PROJECTION CHAMBER
SLAC-PEP-005	A GENERAL SURVEY OF PARTICLE PRODUCTION AT PEP
SLAC-PEP-006	A LEPTON TOTAL ENERGY DETECTOR AT PEP
SLAC-PEP-009	A PEP FORWARD DETECTOR FACILITY
SLAC-PEP-012	A HIGH RESOLUTION SPECTROMETER AT PEP
SLAC-PEP-014	A SEARCH FOR FREE QUARKS AT PEP
SLAC-PEP-020	DELCO AT PEP
SLAC-PEP-021	PROPOSAL TO SEARCH FOR $e^+ e^- \rightarrow$ UNSEEN STATES USING PHOTON TAGGING
SLAC-SLC-SLD	SLD DETECTOR FOR THE SLC
SLAC-SLC-6	MARK II AT THE SLC
SLAC-SP-030	A LARGE SOLID ANGLE NEUTRAL DETECTOR FOR SPEAR II (THE CRYSTAL BALL)
SLAC-SP-031	CHECKOUT OF MARK III DETECTOR AT SPEAR
SLAC-SP-032	MARK-III AT SPEAR
TRIUMF-009	PION RADIATIVE CAPTURE AND CHARGE EXCHANGE IN FLIGHT
TRIUMF-052	A NEW MEASUREMENT OF THE $\pi^0 \rightarrow e^+ e^-$ BRANCHING RATIO -- A TEST OF THE STANDARD MODEL
TRIUMF-104	SEARCH FOR MUON-ELECTRON CONVERSION AT TRIUMF
TRIUMF-121	TEST OF CHARGE-SYMMETRY IN $n p$ SCATTERING
TRIUMF-132-192	MEASUREMENT OF THE PION PRODUCTION ASYMMETRIES AND CROSS SECTIONS FROM REACTION $p p \rightarrow$ DEUT π^+ WITH A POLARIZED PROTON BEAM AT ENERGIES 350-500 MEV
TRIUMF-134	MEASUREMENT OF THE PARAMETER η IN MUON DECAY
TRIUMF-137	LIFETIME OF THE POSITIVE MUON
TRIUMF-168	2S MUONIUM PRODUCTION FROM THIN FOILS
TRIUMF-171	TEST OF T-INVARIANCE IN $p p$ SCATTERING
TRIUMF-174	SPIN DEPENDENCE OF THE $p p \rightarrow p n \pi^+$ REACTION
TRIUMF-181	MEASUREMENT OF THE 1S STRONG INTERACTION SHIFT IN PIONIC HYDROGEN
TRIUMF-185	PRECISE MEASUREMENT OF THE POLARIZATION PARAMETER XI; A SEARCH FOR THE EFFECTS OF A RIGHT-HANDED GAUGE BOSON IN μ^+ DECAY
TRIUMF-190	RADIATIVE POLARIZED NEUTRON CAPTURE ON PROTONS
TRIUMF-205	Tensor ANALYZING POWER IN PION DEUTERIUM SCATTERING
TRIUMF-208	PROTON-PROTON BREMSSTRAHLUNG
TRIUMF-217	LOW ENERGY, ELECTROMAGNETIC PION FORM FACTORS
TRIUMF-247	PRECISE MEASUREMENT OF MUON DECAY ASYMMETRY PARAMETER Δ
TRIUMF-248	A STUDY OF THE π^+ \rightarrow $e^+ \nu_e$ DECAY
TRIUMF-277	THE BRANCHING RATIO OF THE RARE DECAY $\pi^0 \rightarrow e^+ e^-$

BEAM-TARGET-MOMENTUM INDEX

BEAM AND TARGET	LAB MOMENTUM OR MOMENTUM RANGE (GEV/C)	EXPERIMENT	BEAM AND TARGET	LAB MOMENTUM OR MOMENTUM RANGE (GEV/C)	EXPERIMENT
GAMMA P	<1.3	INS-15-2	NUMU NUCLEUS	0.	500.0
GAMMA P	<200.0	CERN-NA-014	NUMU NUCLEUS	<400.0	FNAL-733
GAMMA P	<200.0	CERN-NA-014-2	NUMU NUCLEUS	<500.0	FNAL-744
GAMMA P	0.6	INS-15-1	NUMU NUCLEUS	0.5	FNAL-745
GAMMA P	0.8	INS-14-3	NUMU NUCLEUS	0.5	CERN-PS-181
GAMMA P	1.2	INS-17-1	NUMU NUCLEUS	10.0	CERN-PS-180
GAMMA P	10.5	SLAC-BC-076	NUMU NUCLEUS	10.0	SERP-E-107
GAMMA P	20.0	SLAC-BC-072	NUMU NUCLEUS	10.0	CERN-WA-059
GAMMA P	20.0	SLAC-BC-073	NUMU NUCLEUS	10.0	FNAL-531
GAMMA P	20.0	SLAC-BC-075	NUMU NUCLEUS	10.0	FNAL-564
GAMMA P	40.0	FNAL-691	NUMU NUCLEUS	10.0	CERN-WA-047
GAMMA P	70.0	FNAL-516	NUMU NUCLEUS	10.0	FNAL-636
GAMMA P	70.0	CERN-WA-069	NUMU NUCLEUS	10.0	FNAL-632
GAMMA P	80.0	FNAL-612	NUMU NUCLEUS	20.0	FNAL-652
GAMMA P	200.0	FNAL-683	NUMU NUCLEUS	25.0	FNAL-616
GAMMA N	0.5	INS-14-4	NUMU NUCLEUS	>60.0	FNAL-553
GAMMA NUCLEON	10.0	CERN-NA-001	NUMU	0.	LAMPF-645
GAMMA DEUT	0.3	INS-16-1	NUMU	5.3E-02	LAMPF-764
GAMMA DEUT	0.4	INS-15-3	NUMU	0.	0.3
GAMMA DEUT	0.5	INS-19-1	NUMU	0.	4.0
GAMMA DEUT	0.5	INS-18-3	NUMU	6.0E-02	7.0
GAMMA HE	0.2	INS-19-2	NUMU	0.5	0.3
GAMMA NUCLEUS	0.	FNAL-458	ANUMU E-	0.	12.0
GAMMA NUCLEUS	0.2	INS-17-2	ANUMU E-	0.	200.0
GAMMA NUCLEUS	0.2	INS-18-1	ANUMU E-	0.	230.0
GAMMA NUCLEUS	0.2	INS-16-2	ANUMU E-	0.	260.0
GAMMA NUCLEUS	0.3	INS-19-3	ANUMU E-	<400.0	CERN-PS-169
GAMMA NUCLEUS	0.4	INS-15-3	ANUMU E-	5.0	100.0
GAMMA NUCLEUS	0.7	INS-15-4	ANUMU P	0.	12.0
GAMMA NUCLEUS	10.0	CERN-NA-001	ANUMU P	0.	150.0
GAMMA NUCLEUS	20.0	CERN-WA-058	ANUMU P	0.	200.0
GAMMA NUCLEUS	200.0	FNAL-687	ANUMU P	0.	230.0
GAMMA CRYSTAL	100.0	CERN-NA-033	ANUMU P	0.	260.0
			ANUMU P	2.0	30.0
			ANUMU N	0.	12.0
			ANUMU N	0.	200.0
			ANUMU N	0.	260.0
			ANUMU NUCLEON	10.0	600.0
			ANUMU DEUT	0.	260.0
			ANUMU DEUT	0.	260.0
			ANUMU NE	10.0	200.0
			ANUMU AL	2.0	30.0
			ANUMU FE	0.	160.0
			ANUMU FE	0.	260.0
			ANUMU FE	0.	260.0
			ANUMU FE	2.0	30.0
			ANUMU FE	30.0	230.0
			ANUMU NUCLEUS	0.	6.0
			ANUMU NUCLEUS	0.	6.0
			ANUMU NUCLEUS	0.	160.0
			ANUMU NUCLEUS	0.	230.0
			ANUMU NUCLEUS	0.	260.0
			ANUMU NUCLEUS	0.	500.0
			ANUMU NUCLEUS	<400.0	FNAL-744
			ANUMU NUCLEUS	10.0	20.0
			ANUMU NUCLEUS	10.0	100.0
			ANUMU NUCLEUS	10.0	100.0
			ANUMU NUCLEUS	10.0	100.0
			ANUMU NUCLEUS	10.0	200.0
			ANUMU NUCLEUS	10.0	400.0
			ANUMU NUCLEUS	20.0	600.0
			ANUMU NUCLEUS	25.0	250.0
			ANUMU NUCLEUS	>60.0	FNAL-553
			ANUMU	0.	5.3E-02
			ANUMU	6.0E-02	0.3
			NUTAU NE	10.0	200.0
			NUTAU NUCLEUS	10.0	250.0
			ANUTAU NE	10.0	200.0
			E- P	6.4	SLAC-E-130
			E- P	14.0	SLAC-E-136
			E- P	16.2	SLAC-E-130
			E- P	21.0	SLAC-E-136
			E- P	22.6	SLAC-E-130
			E- P	28.5	SLAC-E-136
			E- DEUT	6.4	SLAC-E-130
			E- DEUT	16.2	SLAC-E-130
			E- DEUT	22.6	SLAC-E-130
			E- NUCLEUS	20.0	SLAC-E-137
			E-	1.0	CERN-PS-188
			E-	5.0	CERN-WA-064
			E+ E-	?	SLAC-SP-031
			E+ E-	0.2	CERN-NA-007
			E+ E-	0.2	CERN-NA-007
			E+ E-	0.2	CERN-NA-007
			E+ E-	0.2	CERN-NA-007
			E+ E-	1.5	4.2
			E+ E-	1.5	SLAC-SP-030
			E+ E-	1.8	SLAC-SP-032
			E+ E-	1.8	SLAC-SP-032

MOMENTUM RANGES FOR NEUTRINO AND ANTINEUTRINO BEAMS ARE NOT DEFINED VERY SYSTEMATICALLY.

FOR E+E- COLLIDING BEAM EXPERIMENTS, WE GIVE THE CENTER-OF-MASS (=LAB) MOMENTA RATHER THAN THE EQUIVALENT LAB MOMENTUM FOR SCATTERING ON A STATIONARY TARGET.

BEAM-TARGET-MOMENTUM INDEX

BEAM AND TARGET	LAB MOMENTUM OR MOMENTUM RANGE (GEV/C)		EXPERIMENT	BEAM AND TARGET	LAB MOMENTUM OR MOMENTUM RANGE (GEV/C)		EXPERIMENT
E+ E-	1.9		SLAC-SP-032	PI+ P	280.0		CERN-WA-070
E+ E-	2.0	2.5	SLAC-SP-032	PI+ P	400.0		FNAL-609
E+ E-	2.2	5.6	DESY-CRYSTAL-BAL	PI+ N	5.0	20.0	SERP-E-102
E+ E-	3.7	5.8	DESY-LENA	PI+ N	20.0		CERN-WA-056
E+ E-	4.0	18.0	SLAC-PEP-002	PI+ DEUT	3.8E-02		LAMPF-828
E+ E-	4.0	18.0	SLAC-PEP-005	PI+ DEUT	5.4E-02		LAMPF-828
E+ E-	4.0	18.0	SLAC-PEP-006	PI+ DEUT	6.6E-02		LAMPF-828
E+ E-	4.0	18.0	SLAC-PEP-012	PI+ DEUT	9.5E-02	0.2	LAMPF-767
E+ E-	4.5	5.8	DESY-ARGUS	PI+ DEUT	0.1		LAMPF-567
E+ E-	4.5	6.0	CESR-CLEO	PI+ DEUT	0.2		LAMPF-567
E+ E-	4.7	5.8	CESR-CUSB	PI+ DEUT	0.2		LAMPF-567
E+ E-	5.0	22.0	DESY-PETRA-JADE	PI+ DEUT	0.2	0.4	TRIUMF-205
E+ E-	6.0	15.0	SLAC-PEP-009	PI+ DEUT	0.2		LAMPF-567
E+ E-	6.0	23.5	DESY-PETRA-MARKJ	PI+ DEUT	0.2	0.6	LAMPF-682
E+ E-	6.0	23.5	DESY-PETRA-TASSO	PI+ DEUT	0.2		LAMPF-567
E+ E-	7.0	23.7	DESY-PETRA-CELLO	PI+ DEUT	0.2	0.4	SIN-R-79-07
E+ E-	14.5		SLAC-PEP-004	PI+ DEUT	0.2	0.4	SIN-R-78-18
E+ E-	14.5		SLAC-PEP-014	PI+ DEUT	0.2	0.3	SIN-R-73-01-2
E+ E-	14.5		SLAC-PEP-020	PI+ DEUT	0.2		LAMPF-567
E+ E-	14.5		SLAC-PEP-021	PI+ DEUT	0.2		LAMPF-567
E+ E-	17.5		DESY-PETRA-PLU-2	PI+ DEUT	0.2		LAMPF-478
E+ E-		<35.0	KEK-TE-001	PI+ DEUT	0.3	0.6	LAMPF-825
E+ E-		<35.0	KEK-TE-002	PI+ DEUT	0.3	0.4	LAMPF-605
E+ E-		<35.0	KEK-TE-003	PI+ DEUT	0.4		LAMPF-581
E+ E-	50.0		SLAC-SLC-SLD	PI+ DEUT	0.4		LAMPF-783
E+ E-	50.0		SLAC-SLC-6	PI+ DEUT	0.4	0.7	LENI-SC-062
E+ E-	?		CERN-LEP-ALEPH	PI+ DEUT	0.5		LAMPF-783
E+ E-	?		CERN-LEP-DELPHI	PI+ DEUT	0.5	1.2	KEK-083
E+ E-	?		CERN-LEP-L3	PI+ DEUT	0.6		LAMPF-783
E+ E-	?		CERN-LEP-OPAL	PI+ DEUT	0.7		KEK-081
E+	1.0	10.0	CERN-PS-188	PI+ DEUT	1.0	1.4	CERN-PS-159
E+	5.0	20.0	CERN-WA-064	PI+ DEUT	1.5		KEK-081
MU- P	0.		SIN-R-78-15-1	PI+ DEUT	300.0		FNAL-705
MU- P	120.0	280.0	CERN-NA-002	PI+ DEUT	750.0		FNAL-705
MU- P	120.0	280.0	CERN-NA-009	PI+ HE3	0.1	0.3	SIN-R-79-05
MU- HE	0.		BNL-745	PI+ HE3	0.2		LAMPF-546
MU- HE	0.		SIN-R-82-03-1	PI+ HE3	0.3		LAMPF-546
MU- C12	0.		SIN-R-77-01	PI+ TRIT	0.2		LAMPF-546
MU- NUCLEUS	0.		LAMPF-421	PI+ TRIT	0.3		LAMPF-546
MU- NUCLEUS	0.		TRIUMF-104	PI+ HE	100.0	150.0	CERN-NA-008
MU- NUCLEUS	0.2		SIN-R-81-02	PI+ C	530.0		FNAL-706
MU- NUCLEUS	100.0	250.0	CERN-NA-004	PI+ C12	1.0		BNL-758
MU-	0.2		SIN-R-83-29	PI+ NUCLEUS	0.2	2.0	KEK-094
MU+ E-	?		TRIUMF-168	PI+ NUCLEUS	1.0	5.0	KEK-090
MU+ E-	5.0E-03		LAMPF-869	PI+ NUCLEUS	1.0	9.0	ITEP-E-771
MU+ AL	0.1		BNL-754	PI+ NUCLEUS	1.5		ITEP-E-812
MU+	0.		LAMPF-400-445	PI+ NUCLEUS	1.8		ITEP-E-823
MU+	0.		LAMPF-444	PI+ NUCLEUS	3.0		ITEP-E-823
MU+	0.		LAMPF-455	PI+ NUCLEUS	30.0		CERN-WA-072
MU+	0.		TRIUMF-134	PI+ NUCLEUS	75.0		FNAL-615
MU+	0.		TRIUMF-137	PI+ NUCLEUS	100.0		FNAL-597
MU+	0.		TRIUMF-247	PI+ NUCLEUS	140.0	300.0	CERN-NA-010
MU+	3.0E-02		TRIUMF-185	PI+ NUCLEUS	150.0		CERN-NA-003
MU+	5.2E-02		TRIUMF-248	PI+ NUCLEUS	200.0		CERN-NA-003
MU+	0.1		SIN-R-74-05	PI+ NUCLEUS	200.0		FNAL-565
MU+	0.2		SIN-R-83-29	PI+ NUCLEUS	200.0		FNAL-629
MUON P	750.0		FNAL-665	PI+ NUCLEUS	250.0		CERN-NA-022
MUON NUCLEUS	280.0		CERN-NA-028	PI+ NUCLEUS	250.0		FNAL-615
MUON NUCLEUS	325.0		CERN-NA-028	PI+ NUCLEUS	280.0		CERN-NA-003
MUON NUCLEUS	750.0		FNAL-665	PI+ NUCLEUS	500.0		FNAL-672
TAU-	0.	70.0	SERP-E-152	PI+	0.		LAMPF-400-445
PION NUCLEUS	?		CERN-NA-018	PI+	0.		LAMPF-650
PION NUCLEUS	350.0		CERN-NA-019	PI+	0.		SIN-R-78-13-1
PI+ P	0.1		SIN-R-82-17	PI+	0.		SIN-R-81-09
PI+ P	0.1		LAMPF-567	PI+	7.0E-02		TRIUMF-052
PI+ P	0.2		LAMPF-567	PI+	8.5E-02		TRIUMF-248
PI+ P	0.2		LAMPF-567	PI+	9.0E-02		SIN-R-82-04
PI+ P	0.2		LAMPF-567	PI+	0.1		SIN-R-80-11
PI+ P	0.2		LAMPF-567	PI+	0.2		SIN-R-82-01
PI+ P	0.2		LAMPF-567	PI+	0.5		SIN-R-71-08
PI+ P	0.2		LAMPF-567	PI+	1.0	10.0	LAMPF-032
PI+ P	0.2		LAMPF-567	PI+	2.0	20.0	CERN-PS-188
PI+ P	0.2		LAMPF-058-120	PI+	?		CERN-PS-164
PI+ P	0.3	0.5	CERN-SC-094	PIO	?		TRIUMF-277
PI+ P	0.4	0.6	LAMPF-806	PIO	?		LAMPF-400-445
PI+ P	0.5	0.7	LAMPF-849	PIO	0.		LAMPF-726
PI+ P	0.5		LAMPF-032	PIO	0.		TRIUMF-217
PI+ P	0.7		LAMPF-058-120	PIO	0.		TRIUMF-217
PI+ P	1.4	2.1	ITEP-E-801	PIO	<0.3		CERN-SC-077
PI+ P	1.5	1.9	CERN-PS-160	PIO	<70.0		SERP-E-119
PI+ P	2.5	14.0	CERN-PS-157	PI- E-	250.0		CERN-NA-007
PI+ P	5.0	20.0	SERP-E-102	PI- E-	300.0		CERN-NA-007
PI+ P	10.0		BNL-755	PI- P	0.		SIN-R-81-01
PI+ P	20.0		CERN-WA-056	PI- P	0.		TRIUMF-181
PI+ P	50.0	200.0	CERN-WA-006	PI- P	0.		TRIUMF-217
PI+ P	85.0		CERN-WA-076	PI- P	<8.0		KEK-064
PI+ P	100.0		FNAL-577	PI- P	7.7E-02	0.3	TRIUMF-009
PI+ P	100.0		FNAL-597	PI- P	8.6E-02	0.1	LAMPF-190
PI+ P	147.0		FNAL-570	PI- P	9.5E-02	0.2	LAMPF-808
PI+ P	150.0	300.0	CERN-NA-024	PI- P	0.1		SIN-R-82-17
PI+ P	200.0		CERN-WA-070	PI- P	0.2	0.4	SIN-R-75-07-2
PI+ P	200.0		FNAL-577	PI- P	0.2		LAMPF-058-120
PI+ P	250.0		CERN-NA-022	PI- P	0.2	0.7	LAMPF-804
PI+ P				PI- P	0.3	0.5	CERN-SC-094
PI+ P				PI- P	0.4	0.6	LAMPF-806

BEAM-TARGET-MOMENTUM INDEX

BEAM AND TARGET	LAB MOMENTUM OR MOMENTUM RANGE (GEV/C)		EXPERIMENT	BEAM AND TARGET	LAB MOMENTUM OR MOMENTUM RANGE (GEV/C)		EXPERIMENT
PI- P	0.5	0.7	LAMPF-849	PI- NUCLEUS	30.0		SERP-E-148
PI- P	0.7		LAMPF-058-120	PI- NUCLEUS	40.0		SERP-E-143
PI- P	1.4	2.1	ITEP-E-801	PI- NUCLEUS	40.0		SERP-E-148
PI- P	2.0	14.0	CERN-PS-157	PI- NUCLEUS	75.0		FNAL-615
PI- P	8.0		BNL-771	PI- NUCLEUS	100.0		FNAL-597
PI- P	8.0		KEK-121	PI- NUCLEUS	125.0		FNAL-537
PI- P	10.0		BNL-755	PI- NUCLEUS	140.0	300.0	CERN-NA-010
PI- P	12.0		CERN-WA-056	PI- NUCLEUS	150.0		CERN-NA-003
PI- P	13.0		BNL-726	PI- NUCLEUS	200.0		CERN-NA-003
PI- P	13.0		BNL-732	PI- NUCLEUS	200.0		FNAL-490
PI- P	13.0		SERP-E-116	PI- NUCLEUS	200.0		FNAL-515
PI- P	13.5		BNL-755	PI- NUCLEUS	200.0		FNAL-565
PI- P	20.0		BNL-705	PI- NUCLEUS	250.0		FNAL-615
PI- P	20.0		CERN-WA-007	PI- NUCLEUS	280.0		CERN-NA-003
PI- P	20.0		SERP-E-148	PI- NUCLEUS	300.0		CERN-NA-017
PI- P	20.0		SERP-E-105	PI- NUCLEUS	350.0		CERN-WA-071
PI- P	21.0	40.0	BNL-769	PI- NUCLEUS	350.0		CERN-WA-078
PI- P	22.0		BNL-747	PI- NUCLEUS	350.0		FNAL-653
PI- P	25.0		SERP-E-116	PI- NUCLEUS	360.0		CERN-WA-075
PI- P	30.0		SERP-E-148	PI- NUCLEUS	360.0		FNAL-597
PI- P	33.0		SERP-E-142	PI- NUCLEUS	500.0		FNAL-672
PI- P	38.0		SERP-E-140	PI-	?		SERP-E-115
PI- P	40.0		CERN-WA-007	PI-	4.0E-02		SIN-R-78-15-1
PI- P	40.0		SERP-E-112	PI-	4.0E-02		SIN-R-82-03-1
PI- P	40.0		SERP-E-116	PI-	1.0	10.0	CERN-PS-188
PI- P	40.0		SERP-E-147	PI-	2.0	20.0	CERN-PS-164
PI- P	40.0		SERP-E-148				
PI- P	60.0		CERN-WA-007	RHO0	20.0		SERP-E-148
PI- P	80.0		CERN-WA-007	RHO0	30.0		SERP-E-148
PI- P	85.0		CERN-WA-067	RHO0	40.0		SERP-E-148
PI- P	100.0		FNAL-577	OMEGA	38.0		SERP-E-140
PI- P	100.0		FNAL-597	PHI	38.0		SERP-E-140
PI- P	100.0	345.0	CERN-NA-008	A1(1270)-	20.0		SERP-E-148
PI- P	140.0		CERN-WA-011	A1(1270)-	30.0		SERP-E-148
PI- P	147.0		FNAL-570	A1(1270)-	40.0		SERP-E-148
PI- P	150.0		CERN-NA-005	D(1285)	33.0		SERP-E-142
PI- P	150.0	300.0	CERN-NA-024	FRIME	33.0		SERP-E-142
PI- P	175.0		FNAL-663	A3(1680)-	20.0		SERP-E-148
PI- P	200.0		CERN-WA-070	A3(1680)-	30.0		SERP-E-148
PI- P	200.0		FNAL-577	A3(1680)-	40.0		SERP-E-148
PI- P	200.0		FNAL-580				
PI- P	280.0		CERN-WA-070	K+ P	10.0		BNL-755
PI- P	300.0		CERN-NA-005	K+ P	11.0		SLAC-E-135
PI- P	300.0		CERN-NA-012	K+ P	32.1		SERP-E-133
PI- P	360.0		CERN-NA-016	K+ P	70.0		CERN-WA-027
PI- P	360.0		CERN-NA-027	K+ P	100.0		FNAL-577
PI- P	360.0		FNAL-597	K+ P	100.0		FNAL-597
PI- DEUT	0.		SIN-R-81-01	K+ P	147.0		FNAL-570
PI- DEUT	9.5E-02	0.2	LAMPF-767	K+ P	200.0		FNAL-577
PI- DEUT	9.5E-02	0.3	LAMPF-295	K+ P	250.0		CERN-NA-022
PI- DEUT	0.2		LAMPF-478	K+ N	1.1		KEK-034
PI- DEUT	0.3		LAMPF-689	K+ N	1.3		KEK-034
PI- DEUT	0.4		LAMPF-581	K+ N	1.4		KEK-034
PI- DEUT	0.4		LAMPF-783	K+ N	1.5		KEK-034
PI- DEUT	0.4	1.2	KEK-083	K+ N	5.0	20.0	SERP-E-102
PI- DEUT	0.5		LAMPF-783	K+ N	75.0		FNAL-585
PI- DEUT	0.6		LAMPF-783	K+ N	100.0		FNAL-585
PI- DEUT	1.0	1.4	CERN-PS-159	K+ N	150.0		FNAL-585
PI- DEUT	300.0		FNAL-705	K+ DEUT	1.5		KEK-081
PI- DEUT	750.0		FNAL-705	K+ DEUT	1.7		KEK-081
PI- HE3	0.	0.3	SIN-R-79-05	K+ XE	0.8		ITEP-E-802
PI- HE3	0.2		LAMPF-546	K+ XE	0.8		ITEP-E-761
PI- HE3	0.3		LAMPF-546	K+ NUCLEUS	100.0		FNAL-597
PI- TRIT	0.2		LAMPF-546	K+ NUCLEUS	200.0		FNAL-565
PI- TRIT	0.3		LAMPF-546	K+ NUCLEUS	250.0		CERN-NA-022
PI- HE	50.0	300.0	CERN-NA-008	K+ NUCLEUS	500.0		FNAL-672
PI- BE	100.0	200.0	CERN-NA-011	K+	?		KEK-104
PI- BE	185.0		FNAL-673	K+	0.		BNL-787
PI- BE	225.0		FNAL-326	K+	0.		KEK-099
PI- BE	225.0		FNAL-610	K+		<0.5	KEK-089
PI- BE	275.0		FNAL-650	K+	0.5	0.7	KEK-010
PI- BE	350.0		CERN-WA-077	K+	2.0	20.0	CERN-PS-164
PI- C	530.0		FNAL-706	K+	4.0		BNL-735
PI- SI	40.0		SERP-E-157	K+	6.0		BNL-777
PI- SI	200.0		CERN-NA-032	K0	?		BNL-749
PI- FE	278.0		FNAL-595	K0	0.8		ITEP-E-761
PI- CU	20.0		SERP-E-148	KS	1.0	8.0	ITEP-E-811
PI- CU	30.0		SERP-E-148	KS	50.0	150.0	CERN-NA-031
PI- CU	40.0		SERP-E-148	KS	50.0	200.0	FNAL-621
PI- CU	225.0		FNAL-326	KL CU	1.0	8.0	ITEP-E-811
PI- SN	225.0		FNAL-326	KL	1.0	8.0	ITEP-E-811
PI- WT	225.0		FNAL-326	KL	1.0	8.0	ITEP-E-821
PI- PB	100.0	200.0	CERN-NA-029	KL	4.0	12.0	BNL-780
PI- NUCLEUS		<4.3	KEK-082	KL	4.0	20.0	BNL-791
PI- NUCLEUS	0.2	2.0	KEK-094	KL	5.0	10.0	FNAL-721
PI- NUCLEUS	1.0		SERP-E-127	KL	30.0	200.0	FNAL-617
PI- NUCLEUS	1.0	9.0	ITEP-E-771	KL	50.0	150.0	CERN-NA-031
PI- NUCLEUS	1.5		ITEP-E-812	KL	50.0	150.0	FNAL-731
PI- NUCLEUS	1.8		ITEP-E-823	KL	50.0	200.0	FNAL-621
PI- NUCLEUS	2.5		ITEP-E-813	K- E-	250.0		CERN-NA-007
PI- NUCLEUS	3.0		ITEP-E-823	K- P	0.		CERN-PS-165
PI- NUCLEUS	5.0		ITEP-E-813	K- P	0.7		BNL-702
PI- NUCLEUS	20.0		SERP-E-148	K- P	2.2		BNL-698
PI- NUCLEUS	30.0		CERN-WA-072	K- P	4.7		CERN-PS-157

BEAM-TARGET-MOMENTUM INDEX

BEAM AND TARGET	LAB MOMENTUM OR MOMENTUM RANGE (GEV/C)		EXPERIMENT	BEAM AND TARGET	LAB MOMENTUM OR MOMENTUM RANGE (GEV/C)		EXPERIMENT
K-P	6.0		BNL-771	P P	1.3		LAMPF-790
K-P	8.0	16.0	CERN-WA-074	P P	1.3	1.5	LAMPF-636
K-P	10.0		BNL-755	P P	1.3	3.2	SACLAY-052-2
K-P	11.0		SLAC-E-135	P P	1.3	1.6	LENI-SC-056
K-P	13.0		SERP-E-116	P P	1.3		LAMPF-517
K-P	20.0		CERN-WA-007	P P	1.4		LAMPF-517
K-P	20.0		SERP-E-148	P P	1.4		LAMPF-708
K-P	22.0		BNL-747	P P	1.5		LAMPF-385
K-P	25.0		SERP-E-116	P P	1.5		LAMPF-492
K-P	30.0		SERP-E-148	P P	1.5		LAMPF-015
K-P	33.0		SERP-E-142	P P	1.5		LAMPF-194
K-P	40.0		CERN-WA-007	P P	1.5		LAMPF-336
K-P	40.0		SERP-E-112	P P	1.5		LAMPF-392
K-P	40.0		SERP-E-116	P P	1.5		LAMPF-402
K-P	40.0		SERP-E-148	P P	1.5		LAMPF-457
K-P	60.0		CERN-WA-007	P P	1.5		LAMPF-462
K-P	75.0		FNAL-585	P P	1.5		LAMPF-517
K-P	80.0		CERN-WA-007	P P	1.5		LAMPF-563
K-P	100.0		FNAL-577	P P	1.5		LAMPF-590
K-P	100.0		FNAL-585	P P	1.5		LAMPF-637
K-P	108.6		CERN-WA-028	P P	1.5		LAMPF-708
K-P	150.0		FNAL-585	P P	1.5		LAMPF-758
K-P	175.0		FNAL-663	P P	1.5		LAMPF-790
K-P	200.0		FNAL-577	P P	1.5		LAMPF-792
K-DEUT	0.9		BNL-773	P P	1.5		LAMPF-846
K-DEUT	1.0	1.4	CERN-PS-159	P P	1.5		SACLAY-088
K-HE	0.7		BNL-774	P P	1.5		SACLAY-089
K-HE	0.8		BNL-788	P P	1.6		SACLAY-088
K-L16	0.7		BNL-752	P P	1.6		SACLAY-089
K-L16	0.8		BNL-788	P P	1.6		SACLAY-088
K-C	0.8		BNL-759	P P	1.6		SACLAY-089
K-O	0.7		BNL-752	P P	1.7		SACLAY-088
K-SI	40.0		SERP-E-157	P P	1.7		SACLAY-089
K-WT	6.0		BNL-751	P P	1.8		SACLAY-088
K-NUCLEUS	0.		KEK-117	P P	1.8		SACLAY-089
K-NUCLEUS	0.4		CERN-PS-166	P P	5.6		BNL-722
K-NUCLEUS	0.4	0.5	KEK-114	P P	10.0		BNL-755
K-NUCLEUS	0.5		CERN-PS-166	P P	15.0		BNL-748
K-NUCLEUS	0.8		BNL-746	P P	20.0		BNL-748
K-NUCLEUS	0.8		BNL-760	P P	20.0		CERN-WA-007
K-NUCLEUS	0.8		BNL-781	P P	23.0		BNL-748
K-NUCLEUS	1.0		SERP-E-127	P P	24.0		BNL-785
K-NUCLEUS	200.0		FNAL-565	P P	26.0		BNL-748
K-NUCLEUS	500.0		FNAL-672	P P	26.0		BNL-782
K-	?		SERP-E-115	P P	28.5		BNL-748
K-	2.0	20.0	CERN-PS-164	P P	32.0		SERP-E-150
K*(892)0	30.0	200.0	FNAL-617	P P	40.0		CERN-WA-007
MESON-	20.0		SERP-E-148	P P	50.0	200.0	CERN-WA-006
MESON-	30.0		SERP-E-148	P P	60.0		CERN-WA-007
MESON-	40.0		SERP-E-148	P P	70.0		SERP-E-100
				P P	80.0		CERN-WA-007
				P P	85.0		CERN-WA-076
				P P	100.0		FNAL-577
				P P	100.0		FNAL-597
				P P	100.0	300.0	CERN-WA-008
				P P	100.0		FNAL-570
				P P	147.0	300.0	CERN-WA-024
				P P	150.0		FNAL-663
				P P	175.0		CERN-WA-005
				P P	200.0		CERN-WA-025
				P P	200.0		CERN-WA-070
				P P	200.0		FNAL-577
				P P	200.0		FNAL-704
				P P	200.0		CERN-R-420
				P P	212.2		CERN-UA-006
				P P	268.8		CERN-WA-070
				P P	280.0		CERN-R-211
				P P	281.0	2094.0	CERN-R-210
				P P	293.3		CERN-WA-005
				P P	300.0		CERN-WA-016
				P P	300.0		CERN-WA-025
				P P	360.0		CERN-WA-027
				P P	360.0		CERN-WA-023
				P P	>360.0		FNAL-557
				P P	400.0		FNAL-609
				P P	400.0		FNAL-623
				P P	400.0		CERN-R-211
				P P	478.7		CERN-R-421
				P P	478.7		CERN-R-608
				P P	478.7	2047.5	CERN-R-110
				P P	478.7	2047.5	CERN-R-501
				P P	478.7	2047.5	CERN-R-808
				P P	478.7	2114.1	CERN-R-806
				P P	511.2	2047.5	CERN-R-807
				P P	800.0		FNAL-557
				P P	1000.0		FNAL-743
				P P	1030.7	2047.5	CERN-R-421
				P P	1030.7		CERN-R-416
				P P	1440.0		CERN-R-211
				P P	1440.0		CERN-R-420
				P P	1495.9		CERN-R-608
				P P	2047.5		CERN-R-211
				P P	2047.5		CERN-R-419
				P P	2047.5		CERN-R-421

PROTON-PROTON COLLIDING BEAM EXPERIMENTS ARE ORDERED BY THE EQUIVALENT LAB MOMENTUM FOR SCATTERING ON A STATIONARY TARGET RATHER THAN BY THE ACTUAL LAB (=CENTER-OF-MASS) MOMENTUM.

BEAM-TARGET-MOMENTUM INDEX

LAB MOMENTUM OR MOMENTUM RANGE (GEV/C)		EXPERIMENT	LAB MOMENTUM OR MOMENTUM RANGE (GEV/C)		EXPERIMENT
BEAM AND TARGET			BEAM AND TARGET		
P P	2047.5	CERN-R-422	P NUCLEUS	1.7	LENI-SC-021
P P	2047.5	CERN-R-608	P NUCLEUS	1.7	LENI-SC-029
P P	2114.1	CERN-R-420	P NUCLEUS	1.7	LENI-SC-052
P P	1.6E+05	CERN-R-703	P NUCLEUS	1.7	LENI-SC-066
P N		SERP-E-119	P NUCLEUS	2.5	ITEP-E-813
P N	1.1	LAMPF-392	P NUCLEUS	3.7	SACLAY-057
P N	1.2	LAMPF-590	P NUCLEUS	4.5	ITEP-E-831
P N	1.3	KEK-075	P NUCLEUS	5.0	ITEP-E-813
P N	1.4	KEK-075	P NUCLEUS	7.5	ITEP-E-813
P N	1.5	LAMPF-385	P NUCLEUS	12.0	SERP-E-153
P N	1.5	LAMPF-392	P NUCLEUS	12.0	KEK-049
P N	1.5	LAMPF-457	P NUCLEUS	17.0	BNL-790
P N	1.5	LAMPF-590	P NUCLEUS	20.0	FNAL-591
P N	1.5	LAMPF-792	P NUCLEUS	70.0	SERP-E-120
P N	1.5	LAMPF-846	P NUCLEUS	70.0	SERP-E-121
P N	1.6	KEK-075	P NUCLEUS	70.0	SERP-E-144
P N	1.8	KEK-075	P NUCLEUS	100.0	FNAL-597
P N	32.0	SERP-E-150	P NUCLEUS	200.0	FNAL-565
P NUCLEON	1.5	LAMPF-634	P NUCLEUS	200.0	FNAL-629
P DEUT	?	SACLAY-037	P NUCLEUS	200.0	FNAL-466
P DEUT	?	SACLAY-113	P NUCLEUS	400.0	CERN-NA-030
P DEUT	1.0	LAMPF-498	P NUCLEUS	400.0	CERN-WA-038
P DEUT	1.0	SACLAY-068	P NUCLEUS	400.0	CERN-WA-065
P DEUT	1.1	SACLAY-099	P NUCLEUS	400.0	CERN-WA-066
P DEUT	1.1	LAMPF-635	P NUCLEUS	400.0	FNAL-497
P DEUT	1.1	LAMPF-664	P NUCLEUS	400.0	FNAL-549
P DEUT	1.1	LAMPF-853	P NUCLEUS	400.0	FNAL-557
P DEUT	1.2	LENI-SC-108	P NUCLEUS	400.0	FNAL-565
P DEUT	1.2	SACLAY-095	P NUCLEUS	400.0	FNAL-605
P DEUT	1.2	SACLAY-051	P NUCLEUS	400.0	FNAL-613
P DEUT	1.3	LAMPF-585	P NUCLEUS	400.0	FNAL-631
P DEUT	1.3	LAMPF-635	P NUCLEUS	400.0	FNAL-622
P DEUT	1.3	LAMPF-664	P NUCLEUS	450.0	CERN-NA-030
P DEUT	1.3	LAMPF-853	P NUCLEUS	450.0	CERN-WA-068
P DEUT	1.5	LAMPF-385	P NUCLEUS	500.0	FNAL-576
P DEUT	1.5	LAMPF-015	P NUCLEUS	500.0	FNAL-672
P DEUT	1.5	LAMPF-360	P NUCLEUS	750.0	FNAL-508
P DEUT	1.5	LAMPF-462	P NUCLEUS	800.0	FNAL-557
P DEUT	1.5	LAMPF-635	P NUCLEUS	800.0	FNAL-605
P DEUT	1.5	LAMPF-664	P NUCLEUS	1000.0	FNAL-672
P DEUT	1.5	LAMPF-795	P	1.0	CERN-PS-188
P DEUT	1.5	LAMPF-818	P	2.0	CERN-PS-164
P DEUT	1.5	LAMPF-853	N P	0.	CERN-NA-006
P DEUT	1.6	SACLAY-095	N P	0.6	SIN-R-72-02
P DEUT	32.0	SERP-E-150	N P	0.6	TRIUMF-190
P DEUT	70.0	SERP-E-100	N P	0.9	SACLAY-078
P DEUT	300.0	FNAL-705	N P	1.0	LAMPF-498
P DEUT	750.0	FNAL-705	N P	1.0	SACLAY-106
P HE3	1.3	SACLAY-051	N P	1.1	TRIUMF-121
P HE3	1.4	SACLAY-050	N P	1.1	LAMPF-665
P HE3	1.6	SACLAY-050	N P	1.1	LAMPF-683
P HE	0.3	SIN-Z-80-01	N P	1.1	LAMPF-770
P HE	1.5	LAMPF-015	N P	1.2	LAMPF-590
P HE	72.1	CERN-R-210	N P	1.3	LAMPF-498
P HE	100.0	CERN-NA-008	N P	1.3	LAMPF-665
P HE	118.7	CERN-R-110	N P	1.3	LAMPF-683
P HE	126.9	CERN-R-418	N P	1.5	LAMPF-366
P BE	1.5	LAMPF-360	N P	1.5	LAMPF-403
P BE	28.5	BNL-744	N P	1.5	LAMPF-590
P BE	100.0	CERN-NA-011	N P	1.5	LAMPF-498
P BE	200.0	FNAL-673	N P	1.5	LAMPF-589
P BE	250.0	FNAL-673	N P	1.5	LAMPF-665
P BE	400.0	CERN-NA-020	N P	1.5	LAMPF-683
P BE	400.0	FNAL-555	N P	1.5	LAMPF-861
P BE	450.0	CERN-NA-034	N P	10.0	BNL-766
P BE	900.0	FNAL-711	N DEUT	0.6	SIN-R-72-02
P C	400.0	FNAL-706	N C	45.0	SERP-E-104
P C	530.0	FNAL-706	N SI	280.0	FNAL-400
P C	800.0	FNAL-706	N SI	560.0	FNAL-400
P C12	1.5	LAMPF-651	N NUCLEUS	2.0	ITEP-E-822
P SI	1.0	LENI-SC-078	N NUCLEUS	40.0	SERP-E-146
P AR	200.0	CERN-NA-005	N NUCLEUS	300.0	FNAL-630
P CR	500.0	FNAL-524	N	1.4E-04	LAMPF-647
P FE	350.0	FNAL-595	AN P	0.1	BNL-767
P CU	0.9	SACLAY-107	AN NUCLEUS	0.	CERN-PS-179
P CU	400.0	CERN-NA-020	AP P	0.	CERN-PS-170
P AG	500.0	FNAL-524	AP P	0.	CERN-PS-171
P XE	200.0	CERN-NA-005	AP P	0.	CERN-PS-174
P WT	500.0	FNAL-524	AP P	0.	CERN-PS-175
P IR	20.0	CERN-PS-162	AP P	0.	CERN-PS-182
P TH	28.0	BNL-779	AP P	0.	CERN-PS-183
P U	20.0	CERN-PS-162	AP P	0.	CERN-PS-183
P U	28.0	BNL-779	AP P	0.	CERN-PS-161
P NUCLEUS	?	KEK-084	AP P	0.	BNL-708
P NUCLEUS		KEK-082	AP P	0.	CERN-PS-179
P NUCLEUS	0.8	LENI-SC-097	AP P	0.	CERN-PS-170
P NUCLEUS	1.0	LENI-SC-042	AP P	0.2	CERN-PS-173
P NUCLEUS	1.0	LENI-SC-085	AP P	0.2	CERN-PS-172
P NUCLEUS	1.0	SERP-E-127	AP P	0.3	CERN-PS-172
P NUCLEUS	1.0	KEK-113	AP P	0.3	CERN-PS-178
P NUCLEUS	1.0	KEK-090	AP P	0.3	BNL-762
P NUCLEUS	1.0	ITEP-E-771	AP P	0.3	KEK-076
P NUCLEUS	1.0	BNL-778	AP P	0.4	KEK-074A
P NUCLEUS	1.2	SIN-R-81-06	AP P	0.4	BNL-742

BEAM-TARGET-MOMENTUM INDEX

BEAM AND TARGET	LAB MOMENTUM OR MOMENTUM RANGE (GEV/C)		EXPERIMENT	BEAM AND TARGET	LAB MOMENTUM OR MOMENTUM RANGE (GEV/C)		EXPERIMENT
AP P	0.4	1.0	CERN-PS-163-2	AP	2.0E-02		CERN-PS-189
AP P	1.2	1.6	BNL-789	AP	2.0	20.0	CERN-PS-164
AP P	1.5	2.0	CERN-PS-185	LAMBDA P	30.0	60.0	SERP-E-120
AP P	3.0		KEK-062	LAMBDA DEUT	30.0	60.0	SERP-E-120
AP P	3.5		KEK-062	LAMBDA NUCLEUS	80.0	350.0	FNAL-619
AP P	3.5	7.5	CERN-R-704	SIGMA+ P	30.0	60.0	SERP-E-120
AP P	4.0		KEK-062	SIGMA+ DEUT	30.0	60.0	SERP-E-120
AP P	4.5		KEK-062	SIGMA+ ?	?	?	KEK-092
AP P	5.0		BNL-771	SIGMA+ ?	?	?	FNAL-620
AP P	8.0	16.0	CERN-WA-074	SIGMA+ P	120.0	250.0	SERP-E-120
AP P	13.0		SERP-E-116	SIGMA- P	30.0	60.0	CERN-WA-042
AP P	20.0		CERN-WA-007	SIGMA- P	74.0		CERN-WA-042
AP P	20.0		SERP-E-148	SIGMA- DEUT	137.0	60.0	SERP-E-120
AP P	25.0		SERP-E-116	SIGMA- DEUT	30.0		CERN-WA-042
AP P	30.0		SERP-E-148	SIGMA- DEUT	74.0		CERN-WA-042
AP P	32.0		SERP-E-138	SIGMA- DEUT	137.0		CERN-WA-042
AP P	32.0		SERP-E-150	SIGMA- BE	135.0		CERN-WA-062
AP P	40.0		CERN-WA-007	SIGMA- NUCLEUS	0.		BNL-723
AP P	40.0		SERP-E-116	SIGMA- NUCLEUS	1.0		SERP-E-127
AP P	40.0		SERP-E-148	SIGMA- NUCLEUS	20.0	350.0	FNAL-666
AP P	60.0		CERN-WA-007	SIGMA- NUCLEUS	250.0		FNAL-730
AP P	74.0		CERN-WA-042	SIGMA- NUCLEUS	120.0	250.0	FNAL-620
AP P	80.0		CERN-WA-007	SIGMA- ?	250.0		FNAL-715
AP P	100.0		FNAL-577	XI0 P	30.0	60.0	SERP-E-120
AP P	100.0		FNAL-597	XI0 DEUT	30.0	60.0	SERP-E-120
AP P	137.0		CERN-WA-042	XI- P	30.0	60.0	SERP-E-120
AP P	147.0		FNAL-570	XI- P	74.0		CERN-WA-042
AP P	175.0		FNAL-663	XI- DEUT	30.0	60.0	SERP-E-120
AP P	200.0		CERN-WA-005	XI- DEUT	74.0		CERN-WA-042
AP P	200.0		FNAL-577	XI- DEUT	137.0		CERN-WA-042
AP P	200.0		FNAL-704	XI- BE	116.0		CERN-WA-042
AP P	212.2		CERN-R-420	XI- ?	120.0	250.0	FNAL-620
AP P	268.8		CERN-UA-006	OMEGA- P	30.0	60.0	SERP-E-120
AP P	293.3	2094.0	CERN-R-210	OMEGA- DEUT	30.0	60.0	SERP-E-120
AP P	478.7		CERN-R-211	OMEGA- ?	120.0	250.0	FNAL-620
AP P	478.7		CERN-R-421	DEUT P	?	?	SACLAY-066
AP P	478.7		CERN-R-608	DEUT P	0.8	1.5	SACLAY-108
AP P	478.7	2047.5	CERN-R-110	DEUT P	1.5		LAMPF-685
AP P	478.7	2047.5	CERN-R-501	DEUT P	1.6	3.6	SACLAY-115
AP P	478.7	2047.5	CERN-R-808	DEUT P	2.0	4.0	KEK-080
AP P	511.2	2047.5	CERN-R-807	DEUT P	2.4		SACLAY-038
AP P	1030.7		CERN-R-421	DEUT P	2.9		SACLAY-038
AP P	1440.0		CERN-R-211	DEUT P	3.4		SACLAY-038
AP P	1440.0		CERN-R-620	DEUT DEUT	?	?	SACLAY-066
AP P	1495.9		CERN-R-608	DEUT DEUT	1.9	2.6	SACLAY-105
AP P	2047.5		CERN-R-211	DEUT DEUT	2.0	4.0	KEK-125
AP P	2047.5		CERN-R-421	DEUT DEUT	3.0		SACLAY-080
AP P	2047.5		CERN-R-608	DEUT DEUT	3.4		SACLAY-080
AP P	2114.1		CERN-R-420	DEUT DEUT	3.7		SACLAY-080
AP P	5328.0	1.6E+05	CERN-UA-004	DEUT DEUT	254.3		CERN-R-418
AP P	47959.2	2.1E+06	FNAL-710	DEUT HE3	0.2	0.3	SIN-R-73-01-2
AP P	47959.2	2.1E+06	FNAL-713	DEUT LI6	?		SACLAY-010
AP P	1.3E+05	2.1E+06	FNAL-740	DEUT BE	?		SACLAY-010
AP P	1.3E+05	2.1E+06	FNAL-741	DEUT BOR10	?		SACLAY-010
AP P	1.6E+05		CERN-R-703	DEUT NUCLEUS	1.6	3.6	SACLAY-115
AP P	1.6E+05		CERN-UA-001	ADEUT P	12.0	13.0	SERP-E-139
AP P	1.6E+05		CERN-UA-003	ADEUT DEUT	12.0	13.0	SERP-E-139
AP P	1.6E+05		CERN-UA-005	HE3 P	1.8	4.3	SACLAY-085
AP P	2.0E+05		CERN-UA-002	HE3 P	2.5		ITEP-E-782
AP P	3.4E+05	4.3E+05	CERN-UA-005-2	HE3 P	4.7		SACLAY-050
AP P	2.1E+06		FNAL-735	HE3 P	5.0		ITEP-E-782
AP N	32.0		SERP-E-150	HE3 HE3	?		SACLAY-092
AP DEUT	0.		CERN-PS-174	HE3 NUCLEUS	1.8	4.3	SACLAY-085
AP DEUT	0.		CERN-PS-175	TRIT P	2.5		ITEP-E-782
AP DEUT	0.	0.5	CERN-PS-161	TRIT P	5.0		ITEP-E-782
AP DEUT	0.	0.6	BNL-772	HE P	4.3		SACLAY-013
AP DEUT	0.	1.0	CERN-PS-179	HE P	7.0		SACLAY-013
AP DEUT	0.3	1.0	KEK-074	HE DEUT	4.3		SACLAY-013
AP DEUT	32.0		SERP-E-150	HE DEUT	7.0		SACLAY-013
AP DEUT	74.0		CERN-WA-042	HE HE3	4.3		SACLAY-013
AP DEUT	137.0		CERN-WA-042	HE HE3	7.0		SACLAY-013
AP DEUT	300.0		FNAL-705	HE HE3	4.3		SACLAY-013
AP DEUT	750.0		FNAL-705	HE HE3	7.0		SACLAY-013
AP HE3	0.	1.0	CERN-PS-179	HE HE	4.3		SACLAY-013
AP HE	0.	1.0	CERN-PS-179	HE HE	5.0		SACLAY-210
AP NE	0.	1.0	CERN-PS-179	HE HE	70.2	523.5	CERN-R-807
AP AL	0.4	0.6	BNL-742	HE HE	116.9	511.8	CERN-R-110
AP AR	200.0		CERN-WA-005	HE HE	116.9	511.8	CERN-R-808
AP CU	0.4	0.6	BNL-742	HE HE	125.1		CERN-R-418
AP XE	200.0		CERN-WA-005	HE HE	125.1	511.8	CERN-R-807
AP PB	0.4	0.6	BNL-742	HE NUCLEUS	>45.0		CERN-PS-192
AP NUCLEUS	?		KEK-084	BOR12	0.		SIN-R-77-01
AP NUCLEUS	0.		CERN-PS-176	CHARMED-MESON	0.	70.0	SERP-E-152
AP NUCLEUS	0.		CERN-PS-177	HADRON P	200.0	2000.0	FNAL-690
AP NUCLEUS	0.		CERN-PS-186	CHARGED+ P	40.0		CERN-WA-063
AP NUCLEUS	0.	0.5	CERN-PS-161	CHARGED+ ?	10.0	40.0	SERP-E-132
AP NUCLEUS	0.3	0.6	CERN-PS-184	CHARGED+ P	50.0	200.0	FNAL-660
AP NUCLEUS	0.6		CERN-PS-187	CHARGED- P	40.0		CERN-WA-063
AP NUCLEUS	100.0		FNAL-597	CHARGED-	10.0	40.0	SERP-E-132
AP NUCLEUS	125.0		FNAL-537	CHARGED-	50.0	200.0	FNAL-660
AP NUCLEUS	500.0		FNAL-672	NEUTRAL	?		FNAL-584

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ADAIR, R.K.	YALE	BNL-749	DAVIES, J.D.	BIRM	CERN-PS-174
AMALDI, U.	CERN	CERN-LEP-DELPHI	DAVIES, J.D.	BIRM	CERN-SC-077
ANDERSON, H.L.	LANL	LAMPF-455	DEL PRETE, T.	PISA	CERN-R-210
ANTIPOV, Y.M.	SERP	SERP-E-143	DENISOV, S.P.	SERP	SERP-E-152
ANTIPOV, Y.M.	SERP	SERP-E-148	DERRICK, M.	ANL	SLAC-PEP-012
ARNOLD, R.G.	AMER	SLAC-E-136	DEUTSCH, M.	MIT	BNL-760
ASTON, D.	SLAC	SLAC-E-135	DEUTSCH, M.	MIT	BNL-781
AUER, I.P.	ANL	LAMPF-498	DEVLIN, T.	RUTG	FNAL-555
AVILEZ, C.	MEXU	BNL-766	DEVLIN, T.	RUTG	FNAL-619
AXEN, D.A.	BRCO	TRIUMF-174	DIAMBRINI-PALAZZI, G.	GENO	CERN-WA-058
BACKENSTOSS, G.	BASL	SIN-R-79-05	DIAMBRINI-PALAZZI, G.	ROMA	CERN-WA-071
BADERTSCHER, A.	YALE	LAMPF-869	DICK, L.	CERN	CERN-UA-006
BAKER, S.I.	FNAL	FNAL-631	DIGIACOMO, N.	LANL	CERN-PS-187
BALATZ, M.Y.	ITEP	ITEP-E-821	DITZLER, W.R.	ANL	LAMPF-683
BALATZ, M.Y.	ITEP	ITEP-E-811	DOMBECK, T.W.	LANL	LAMPF-764
BALDO-CEOLIN, M.	PADO	CERN-PS-180	DOMBECK, T.W.	LANL	LAMPF-638
BALTAY, C.	COLU	FNAL-646	DORFAN, J.	SLAC	SLAC-SLC-6
BALTAY, C.	COLU	SLAC-SLC-SLD	DUFLO, J.	SACL	SACLAY-013
BALTAY, C.	COLU	FNAL-053A	DYDAK, F.	CERN	CERN-WA-001-2
BARLOUTAUD, R.	SACL	P-DECAY-FREJUS	DZIERBA, A.	IND	FNAL-672
BARLOUTAUD, R.	SACL	CERN-PS-168	ECKHAUSE, M.	WILL	TRIUMF-137
BARNES, P.D.	CMU	BNL-788	ELLIS, R.J.	LANL	LAMPF-647
BARNES, P.D.	CMU	BNL-759	ENDO, I.	HIRO	INS-15-3
BARRELET, E.	EPOI	CERN-PS-157	ERMOLOV, P.F.	SERP	FNAL-180
BARTLETT, D.F.	COLO	FNAL-502	EXTERMANN, P.	GEVA	CERN-WA-042
BATTY, C.J.	RHEL	CERN-PS-165	FASSNACHT, P.	STRB	SACLAY-113
BEER, G.A.	VICT	TRIUMF-181	FAVART, D.	LVLN	CERN-211
BELLINI, G.	MILA	CERN-NA-029	FAVART, D.	SLAC	SLAC-SLC-6
BERKELMAN, K.	CORN	CESR-CLEO	FELST, R.	DESY	DESY-PETRA-JADE
BERTHET, P.	IPN	SACLAY-095	FERRER, A.	CERN	CERN-WA-056
BERTINI, R.	SACL	SACLAY-060	FETSCHER, W.	ETHZ	SIN-R-74-05
BEVINGTON, P.R.	CASE	LAMPF-194	FETSCHER, W.	ETHZ	SIN-R-83-29
BHATIA, T.S.	TAMU	LAMPF-457	FIDECARO, G.	CERN	CERN-WA-006
BHATIA, T.S.	TAMU	LAMPF-846	FIORINI, E.	MILA	CERN-PS-167
BIENLEIN, J.	DESY	DESY-LENA	FIORINI, E.	MILA	P-DECAY-MUSEX
BIENLEIN, J.K.	DESY	DESY-CRYSTAL-BAL	FISHER, C.	RHEL	CERN-NA-016
BIMBOT, L.	IPN	SACLAY-092	FITZGERALD, D.	LANL	LAMPF-808
BLESZYNSKI, M.	UCLA	LAMPF-635	FITZGERALD, D.H.	LANL	LAMPF-849
BLESZYNSKI, M.	UCLA	LAMPF-685	FITZGERALD, D.H.	UCLA	LAMPF-689
BLOOM, E.	SLAC	SLAC-SP-030	FOA, L.	PISA	CERN-NA-001
BLOOM, E.D.	SLAC	SLAC-SP-030	FOA, L.	PISA	CERN-NA-029
BODEK, A.	ROCH	FNAL-595	FONTAINE, J.M.	SACL	SACLAY-104
BOGGILD, H.	COPE	CERN-R-807	FRANCIS, W.	MSU	FNAL-585
BOLOTOV, V.N.	MINR	SERP-E-115	FRANK, S.G.F.	SHMP	CERN-NA-007
BONNER, B.E.	LANL	LAMPF-637	FRANKEL, S.	PENN	LAMPF-421
BONNER, B.E.	LANL	LAMPF-635	FRANKLIN, G.	CMU	BNL-788
BONNER, B.E.	LANL	LAMPF-403	FRANZINI, P.	COLU	CESR-CUSB
BORISOV, V.S.	ITEP	ITEP-E-823	FRASCARIA, R.	IPN	SACLAY-095
BOUDARD, A.	SACL	SACLAY-108	FRASCARIA, R.	IPN	SACLAY-051
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BOVET, E.	NEUC	SIN-R-81-01	FRIEDLANDER, E.M.	LBL	CERN-PS-192
BOWMAN, J.D.	LANL	LAMPF-650	FROSCHE, R.	VILL	SIN-R-82-01
BOWMAN, J.D.	LANL	LAMPF-444	FROSCHE, R.	VILL	SIN-R-71-08
BOWMAN, J.D.	LANL	LAMPF-295	FRYBERGER, D.	SLAC	SLAC-PEP-002
BOWMAN, J.D.	LANL	LAMPF-455	FUKUI, S.	NAGO	KEK-084
BRAU, J.	TENN	SLAC-BC-076	GAARDE, C.	COPE	SACLAY-115
BREIDENBACH, M.	SLAC	SLAC-SLC-SLD	GAARDE, C.	COPE	SACLAY-085
BRESSANI, T.	TORI	CERN-PS-178	GAGO, J.M.	LSBF	CERN-WA-074
BRISCOE, W.J.	UCLA	LAMPF-546	GARCON, M.	SACL	SACLAY-017
BRISCOE, W.J.	GWU	LAMPF-849	GARRETA, D.	SACL	CERN-PS-184
BRISCOE, W.J.	GWU	LAMPF-806	GAZZALY, M.M.	MINN	LAMPF-790
BROCK, R.	MSU	FNAL-733	GEIST, W.	CERN	CERN-R-416
BRUECKNER, W.	MPIH	CERN-PS-166	GEIST, W.	CERN	CERN-R-419
BRYMAN, D.A.	TRIU, VICT	TRIUMF-052	GIBSON, W.	ALBA	FNAL-660
BRYMAN, D.A.	VICT, TRIU	TRIUMF-104	GIMLETT, J.	CIT	SIN-R-81-01
BUDAGOV, Y.A.	JINR	SERP-E-102	GLADISCH, M.W.	HEID	LAMPF-869
BUGG, D.	LOQM	CERN-PS-172	GLASS, G.	TAMU	LAMPF-664
BUNCE, G.	BNL	BNL-755	GLASS, G.	TAMU	LAMPF-402
BUNYATOV, S.A.	JINR	SERP-E-136	GLASS, G.	TAMU	LAMPF-846
BURKE, D.	SLAC	SLAC-PEP-021	GLASS, G.C.	TAMU	LAMPF-589
BURLESON, G.R.	UNM	LAMPF-770	GOLDZAHN, L.	SACL	SACLAY-095
BURLESON, G.R.	NMXS	LAMPF-665	GOTOW, K.	VPI	LAMPF-767
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CAMERON, J.M.	ALBE	TRIUMF-190	GOULIANOS, K.	ROCK	FNAL-612
CAMILLERI, L.	CERN	CERN-R-110	GRACCO, V.	GENO	CERN-WA-007
CARLINI, R.	LANL	LAMPF-634	GRAFSTROM, P.	UOPP	CERN-NA-008
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CASON, N.M.	NDAM	BNL-769	GRAMENITSKY, I.M.	JINR	SERP-E-139
CHEN, H.H.	UCI	LAMPF-225	GRANNIS, P.	STON	FNAL-740
CHRISTENSON, J.H.	NYU	BNL-726	GREEN, D.	FNAL	FNAL-623
CHUNG, S.U.	BNL	BNL-771	GREEN, D.	FNAL	FNAL-580
CLINE, D.	WISC	P-DECAY-HPW	GREENE, S.J.	NMXS	LAMPF-682
COOPER, J.	PENN	FNAL-673	GRUEBLER, W.	ETHZ	SIN-R-73-01-2
COOPER, M.	LANL	LAMPF-808	GUSTAFSON, H.R.	MICH	FNAL-622
COOPER, P.S.	YALE	FNAL-715	GUTAY, L.J.	PURD	FNAL-735
CORMELL, L.R.	ARIZ	FNAL-683	GUTAY, L.J.	PURD	FNAL-591
COUVERT, P.	SACL	SACLAY-068	HAHN, B.	BERN	SIN-R-82-04
COX, B.	FNAL	FNAL-705	HAYANO, R.	TOKY	KEK-099
COX, B.	FNAL	FNAL-537	HEBERT, J.	OTTA	FNAL-576
CROWE, K.M.	LBL	TRIUMF-134	HESS, R.	GEVA	SIN-R-78-06
DALPIAZ, P.	FERR	CERN-PS-170	HESS, R.	GEVA	SIN-R-80-01
DARRIULAT, P.	CERN	CERN-UA-002	HESS, R.	GEVA	SIN-R-71-07

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HIBOU, F.	STRB	SACLAY-010	LANDSBERG, L.G.	SERP	SERP-E-120
HIBOU, F.	STRB, SACL	SACLAY-092	LANDSBERG, L.G.	SERP	SERP-E-142
HIGHLAND, V.L.	TEMP	LAMPF-726	LE BORNEC, Y.	IPN, SACL	SACLAY-092
HIRSCHMANN, H.	VILL	SIN-R-75-07-2	LEE, W.	COLU	FNAL-458
HITLIN, D.	CIT	SLAC-SP-031	LEE, W.	COLU	BNL-776
HITLIN, D.G.	CIT	SLAC-SP-032	LEE-FRANZINI, J.	STON	CESR-CUSB
HOFFMAN, C.M.	LANL	LAMPF-400-445	LEGRAND, D.	SACL	SACLAY-070
HOFFMANN, G.W.	LANL	LAMPF-385	LEHAR, F.	SACL	SACLAY-106
HOFFMANN, G.W.	TEXA	LAMPF-392	LEHAR, F.	SACL	SIN-R-80-01
HOFFMANN, G.W.	TEXA	LAMPF-563	LEHAR, F.	SACL	SACLAY-089
HOFSTADTER, R.	STAN	LAMPF-444	LEHAR, F.	SACL	SACLAY-052
HOLLAS, C.L.	TEXA	LAMPF-636	LEHAR, F.	SACL	SACLAY-087
HOLLAS, C.L.	TEXA	LAMPF-708	LEHAR, F.	SACL	SACLAY-101
HOLLEBEEK, R.	SLAC	SLAC-PEP-021	LEHAR, F.	SACL	SACLAY-088
HOMMA, S.	INUS	INS-17-2	LEHAR, F.	SACL	SACLAY-104
HOMMA, S.	INUS	INS-18-1	LEIPUNER, L.B.	BNL	BNL-749
HOMMA, S.	INUS	INS-19-2	LEISI, H.J.	ETHZ	SIN-R-82-10
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KYCIA, T.F.	BNL	BNL-722	MUSSET, P.	CERN	CERN-NA-019
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WEBSTER, M.S.	VAND	BNL-705	ZIOCK, K.O.H.	VIRG	SIN-R-80-11
WEDDIGEN, C.	KFZK, KARL	SIN-R-78-05-4	ZIOCK, K.O.H.	VIRG	LAMPF-190
WEILHAMMER, P.	CERN	CERN-NA-032	ZOLIN, L.S.	JINR	SERP-E-153
WELSH, R.E.	WILL	BNL-723	ZOLIN, L.S.	JINR	SERP-E-121

ABBREVIATIONS USED ON THE MICROFICHE

JOURNALS

Following are abbreviations for journals listed in the summaries:

AJP	American Journal of Physics
ANNP	Annals of Physics
APP	Acta Physica Polonica
ARNPS	Annual Review of Nuclear and Particle Science
BAPS	Bulletin of the American Physical Society
CNPP	Comments on Nuclear and Particle Physics
HPA	Helvetica Physica Acta
IEEE TNS	Institute of Electrical and Electronics Engineers Transactions in Nuclear Science
JASA	Journal of the Acoustical Society of America
JETPL	JETP Letters (translation of ZETFP)
JJAP	Japanese Journal of Applied Physics
JP	Journale de Physique
JPHY	Journal of Physics
JPL	Journale de Physique Lettres
JPSJ	Journal of the Physical Society of Japan
LNC	Lettere al Nuovo Cimento
NIM	Nuclear Instruments and Methods
NP	Nuclear Physics
PL	Physics Letters
PR	Physical Review
PREP	Physics Reports (Physics Letters C)
PRL	Physical Review Letters
PS	Physica Scripta
RMP	Reviews of Modern Physics
RNC	Rivista del Nuovo Cimento
SHEP	Surveys in High Energy Physics
SJNP	Soviet Journal of Nuclear Physics (translation of YF)
YF	Yadernaya Fizika (translated as SJNP)
ZETFP	Pis'ma v Zhurnal Eksperimental'noi i Teoreticheskoi Fiziki (translated as JETPL)
ZPHY	Zeitschrift fur Physik

KINEMATIC VARIABLES

The following abbreviations are used with reactions to indicate the momenta or energies at which they are studied:

PLAB	beam momentum in the lab frame
TLAB	beam kinetic energy in the lab frame
ECM	total energy in the c.m. frame
Q2	absolute value of the 4-momentum transfer

ACCELERATORS

BNL	Brookhaven (AGS) Proton Synchrotron (31 GeV/c Plab)
CERN-ISR	CERN Intersecting Storage Rings (62 GeV Ecm)
CERN-LEP	CERN Large Electron-Positron Collider
CERN-PBAR/P	CERN Proton-Antiproton Collider (540 GeV Ecm)
CERN-PS	CERN Proton Synchrotron (28 GeV/c Plab)
CERN-SC	CERN Synchro-Cyclotron (600 MeV Tlab)
CERN-SPS	CERN Super Proton Synchrotron (450 GeV/c Plab)
CESR	Cornell Positron-Electron Storage Ring (16 GeV Ecm)
DESY	Deutsches Electron Synchrotron (7.5 GeV/c Plab)
DESY-DORIS	DESY Positron-Electron Ring (11.6 GeV Ecm)
DESY-PETRA	DESY Positron-Electron Colliding Beams (40 GeV Ecm)
FNAL	FNAL Proton Synchrotron (500 GeV/c Plab)
FNAL-COLLIDER	FNAL Proton-Antiproton Collider (2 TeV Ecm)
FNAL-TEV	FNAL Tevatron (1 TeV Plab)
ITEP	Moscow Proton Synchrotron (7 GeV/c Plab)
KEK	KEK Proton Synchrotron (13 GeV/c Plab)
KEK-TRISTAN	KEK Positron-Electron Ring (60 GeV Ecm)
LAMPF	Los Alamos Meson/Proton Factory (1460 MeV/c Plab)
LENI	Leningrad Synchrotron (1 GeV Tlab)
SATURNE-II	Saclay p, d, He Synchrotron
SERP	Serpukhov Proton Synchrotron (76 GeV/c Plab)
SIN	Schweizerisches Inst. für Nuklearforschung (590 MeV Tlab)
SLAC	Stanford Electron Linear Accelerator (33 GeV/c Plab)
SLAC-PEP	SLAC Positron-Electron Project (36 GeV Ecm)
SLAC-SLC	SLAC Linear Collider (100 GeV Ecm)
SLAC-SPEAR	SLAC Positron-Electron Ring (8.4 GeV Ecm)
TOKY	INS Tokyo Electron Synchrotron (1.3 GeV/c Plab)
TRIUMF	Canadian Triangle Universities Meson Facility (520 MeV Tlab)

DETECTORS

For bubble chambers we use a construction such as:

DBC-2M, or HBC-15FT-HYB, or HLBC-BEBC-TST.

The first element, one of

HBC, DBC, HEBE, or HLBC,

tells whether the chamber fill is hydrogen, deuterium, helium, or heavy liquid. The second element gives the size or name of the chamber. Where appropriate, a third element, one of

HYB, RAP, or TST,

indicates that the chamber is part of a hybrid system, or that it is rapid cycling, or that it contains a track-sensitive target.

For non-bubble-chamber detectors, general abbreviations are:

CALO	calorimeter
CNTR	counters (no chambers)
COMB	combinations of different types of detectors, no particular one dominant
DAS	double arm spectrometer
EMUL	emulsion
OSPK	optical spark chambers
OTHER	rare non-electronic detectors (e.g., moon, ocean floor)
PHOTON	photon spectrometer
PLASTIC	lexan or other such material in which tracks are frozen (except emulsion)
SAS	single arm spectrometer
SPEC	general spectrometer
STRC	streamer chamber
WIRE	wire chambers (proportional wire chambers, drift chambers, etc.; includes all non-optical spark chambers by convention)
WAS	wide angle spectrometer

Acronyms for specific detectors:

AFS	CERN-ISR axial field spectrometer
ALEPH	CERN-LEP detector
AMY	KEK-TRISTAN high resolution lepton detector
ARGUS	DESY-DORIS detector system
BIS	JINR spectrometer now at Serpukhov
CCS	FNAL Chicago cyclotron spectrometer
CDF	FNAL-COLLIDER detector
CDHS	CERN-Dortmund-Heidelberg-Saclay neutrino detector (WA1)
CELLO	DESY-PETRA spectrometer system
CHARM	CERN-Hamburg-Amsterdam-Rome-Moscow neutrino detector at CERN
CHARM-II	upgraded CHARM neutrino detector
CLEO	CESR spectrometer
CRYBOX	LAMPF crystal array detector
CRYS-BALL	SLAC-SPEAR and DESY-DORIS large solid angle neutral detector
CUSB	CESR high resolution calorimeter
CUSB-II	upgraded CUSB detector
DELCO	SLAC-SPEAR and PEP detector system

DETECTORS (CONT'D)

DELPHI	CERN-LEP detector
D0	FNAL-COLLIDER detector
EHS	European hybrid spectrometer at CERN-SPS
EMC	CERN-SPS European muon collaboration detector
EPICS	LAMPF energetic pion spectrometer and detection system
FANCY	KEK forward and cylindrical detector
FMPS	FNAL multiparticle spectrometer
GAMS	gamma spectrometer at Serpukhov
HPW	Harvard-Penn-Wisconsin neutrino detector at BNL
HRS	SLAC-PEP high resolution spectrometer
JADE	DESY-PETRA spectrometer system
JANUS	LAMPF proton polarimeter
LAB-E	FNAL target-calorimeter muon-spectrometer detector for neutrino physics
LAHRS	LAMPF high resolution proton spectrometer
LASS	SLAC large aperture solenoid spectrometer
LENA	DESY-DORIS detector system
L3	CERN-LEP detector
MAC	SLAC-PEP magnetic calorimeter
MARK-II	SLAC-SPEAR and PEP spectrometer system
MARK-III	SLAC-SPEAR spectrometer system (not related to MARK-II)
MARK-J	DESY-PETRA spectrometer system
MIS	Serpukhov multiparticle spectrometer
MPS	BNL multiparticle spectrometer
MPS-II	upgraded BNL MPS
OMEGA	CERN OMEGA spectrometer
OMEGAPRIME	upgraded OMEGA spectrometer
OMICRON	CERN-SC spectrometer
OPAL	CERN-LEP detector
PLUTO	DESY-DORIS and PETRA superconducting solenoid spectrometer
RMS	Rutherford multiparticle spectrometer, now at CERN
SFM	CERN-ISR split field magnet
SIGMA	CERN-IHEP magnetic spectrometer at Serpukhov
SLD	SLAC-SLC detector
SPES-I	Saclay SATURNE spectrometer
SPES-III	Saclay SATURNE spectrometer
SPES-IV	Saclay SATURNE spectrometer
SSF	SLAC spectrometer facility -- 1.6, 8, and/or 20 GeV
SUPERBENKEI	KEK superconducting magnetic spectrometer
TASSO	DESY-PETRA spectrometer system
TELAS	KEK target-embodied large-aperture spectrometer
TOKIWA	KEK spectrometer
TOPAZ	KEK-TRISTAN solenoidal spectrometer with TPC
TPC	SLAC-PEP time projection chamber
TPS	FNAL tagged photon spectrometer
UA1	CERN-PBAR/P detector
UA2	CERN-PBAR/P detector
VENUS	KEK-TRISTAN spectrometer
2-GAMMA	SLAC-PEP detector to study 2-gamma process

PARTICLES

ABARYON unspecified antibaryon
ACHARM particle with negative charm
ADEUT antideuteron
AD0 $C=-1 D^0$ meson
AG silver nucleus
AHE anti-helium-4 nucleus
AHE3 anti-helium-3 nucleus
AK0 $S=-1 K^0$
AK*(UNSPEC) unspecified $S=-1 K^*$
AL aluminum nucleus
ALAMBDA antilambda ($S=+1$ antibaryon)
AN antineutron
ANNIHIL pure annihilation final state in N-N scattering
ANOMALON nuclear fragment with anomalous cross section
ANU antineutrino
ANUCLEON antinucleon
ANUCLEUS unspecified antinucleus
ANUE electron antineutrino
ANUINO antiparticle of a light supersymmetric particle
ANUMU muon antineutrino
ANUTAU tau antineutrino
ANYTHING any combination of particles
AP antiproton
AQUARK(1/3) antiquark
AQUARK(2/3) antiquark
AR argon nucleus
ASIGMA antisigma ($S=+1$ antibaryon)
ASTRANGE unspecified $S=+1$ particle
ATRIT anti-tritium nucleus
AU gold nucleus
AXION hypothesized light Higgs scalar boson
AXI anti-xi ($S=+2$ antibaryon)
A1(1270) meson
A2(1320) meson
A3(1680) meson
BARYON unspecified baryon
BARYONIUM meson coupling mainly to baryon-antibaryon
BE beryllium nucleus
BEAUTY particle with nonzero beauty (bottom)
BOR10 boron-10
BOR12 boron-12
B* meson with beauty
B(1235) meson
B(5270) meson with beauty
C carbon nucleus
CA calcium nucleus
CD cadmium nucleus
CENTAURO final state with 50 or more charged particles, no π^0 's
CHARGED charged particle

PARTICLES (CONT'D)

CHARM unspecified particle with charm
CHARMED-BARYON unspecified baryon with charm
CHARMED-MESON unspecified meson with charm
CHI(UNSPEC) unspecified radiative decay product of $\psi(3685)$
CHI(3510) $c\bar{c}$ meson
CHI(3555) $c\bar{c}$ meson
CHI/B(9875) $b\bar{b}$ meson
CHI/B(9895) $b\bar{b}$ meson
CHI/B(9915) $b\bar{b}$ meson
CHI/B(10240) $b\bar{b}$ meson
CHI/B(10255) $b\bar{b}$ meson
CHI/B(10270) $b\bar{b}$ meson
CHI/B(UNSPEC) unspecified radiative decay product of T^* 's
CR chromium nucleus
CRYSTAL crystal, target in channeling experiments
CU copper nucleus
C12 carbon-12 nucleus
C*(4.44) 4.44 keV excited state of carbon
DD diffraction dissociation; followed by particles so produced, e.g. $DD < P \pi^0$ meson
DELTA(980) meson
DEL DEL(1232P33) baryon resonance
DEL(UNSPEC) unspecified $I=3/2$ baryon
DEMION exotic 3-diquark deuteron-like state
DEUT deuteron
DIBARYON unspecified $S=0$ dibaryon
DIHYPERON unspecified $S=-2$ dihyperon
D0 charmed meson
D+ charmed meson
D- charmed meson
D*(2010) charmed meson
D(UNSPEC) unspecified charmed meson
D(1285) meson
EPSILON $\pi-\pi$ S-wave state
ETA meson
ETAPRIME recurrence of the η
ETAPRIME/C recurrence of the η_c
ETA/C lowest mass $JP=0-$ charmonium state
EXOTIC-MESON cannot be formed of quark-antiquark
EXOTIC-NUCLEON cannot be formed of three quarks
E+ positron
E+- electron or positron
E- electron
E(1420) meson
F f(1270) meson
FE iron nucleus
FPRIME f'(1525) meson
FRAG nuclear fragment
F1(1540) meson

PARTICLES (CONT'D)

F+	charmed strange meson
F-	charmed strange meson
GAMMA	photon
GLUEBALL	gluon resonance
GLUON	gluon
HADRON	unspecified hadron
HE	helium-4 nucleus
HE3	helium 3
HIGGS	Higgs boson
HYPERNUC	hypernucleus
HVY-FLAVOR	unspecified particle with heavy flavor quark
HVY-LEPTON	unspecified heavy lepton
HVY-NEUTRINO	heavy neutrino
HVY-NUE	electron neutrino with nonzero mass
HVY-NUMU	muon neutrino with nonzero mass
H(2030)	I=0, JP=4+ meson
INELASTIC	same as ANYTHING, except elastic excluded
IOTA(1440)	meson
IR	iridium nucleus
JET	jet detected as a whole
J/PSI	c \bar{c} meson
KAON	unspecified K or \bar{K}
KL	K _L
KS	K _S
K0	K ⁰
K+	K ⁺
K-	K ⁻
K*(UNSPEC)	unspecified K*
K*(892)	meson
K*(1430)	meson
LAMBDA	S=-1 baryon
LAMBDA/C+	charmed baryon
LAM(UNSPEC)	I=0, S=-1 baryon
LAM(1330B)	unverified bump at 1330 MeV
LAM(1520D03)	baryon resonance
LEPTON	unspecified lepton
LI6	lithium-6 nucleus
LI7	lithium-7 nucleus
LONGLIVED	unspecified particle stable under strong and electromagnetic decay
MESON	unspecified meson
MESON(UNSPEC)	unspecified meson
MG	magnesium nucleus
MONOPOLE	magnetic monopole
MUONIUM	muon-electron atom
MUON	μ^+ or μ^-
MU+	μ^+
MU-	μ^-
N	neutron
NE	neon nucleus

PARTICLES (CONT'D)

NEUTRAL	neutral particle
NIT12	nitrogen-12 nucleus
NNBAR(2020)	nucleon-antinucleon state
NNBAR(2200)	nucleon-antinucleon state
NU	neutrino
NUCLEON	nucleon
NUCLEUS	unspecified nucleus
NUE	electron neutrino
NUINO	any light supersymmetric particle
NUMU	muon neutrino
NUTAU	tau neutrino
N*5/2(UNSPEC)	unspecified I=5/2, S=0 baryon
N*(UNSPEC)	unspecified S=0 baryon resonance
N(UNSPEC)	unspecified I=1/2, S=0 baryon resonance
N(1520D13)	baryon resonance
N(1675D15)	baryon resonance
O	oxygen nucleus
OMEGA	meson resonance
OMEGA-	S=-3 baryon
OMEGA/C0	baryon with quark content ssc (was T ⁰)
OMEGA*(UNSPEC)	unspecified S=-3 baryon resonance
P	proton
PB	lead nucleus
PHI	meson
PHIPRIME	recurrence of the ϕ
PHOTINO	supersymmetric counterpart of photon
PION	π of unspecified charge
PI0	π^0
PI+	π^+
PI+-	π^+ or π^-
PI-	π^-
PRONG	charged prong
PSI(UNSPEC)	unspecified JP=1- charmonium state
PSI(3685)	c \bar{c} meson
PSI(3770)	c \bar{c} meson
QUARK	unspecified quark
QUARK(1/3)	quark
QUARK(2/3)	quark
RHO	meson
RHOPRIME(1600)	meson
SELECTRON	supersymmetric counterpart of electron
SI	silicon nucleus
SIGMA	S=-1 baryon
SIGMA/C	I=1 charmed baryon
SIG(UNSPEC)	unspecified I=1, S=-1 baryon
SIG(1385P13)	baryon resonance
SN	tin nucleus
STRANGE	unspecified strange particle
STRANGEONIUM	meson dominantly s \bar{s} , such as the ϕ

PARTICLES (CONT'D)

SUPERSYM	any supersymmetric particle
S+	intermediate scalar boson
S-	intermediate scalar boson
S*(975)	π - π or K-K S-wave state
S(1935)	meson
TACHYON	hypothesized faster-than-light particle
TAU	heavy lepton
THETA(1690)	meson
TH	thorium nucleus
TOPONIUM	$\bar{t}t$ meson
TRIT	tritium nucleus
TRUTH	particle with nonzero truth (or top)
U	uranium nucleus
UNSPEC	particle of unspecified type
UPSI(UNSPEC)	unspecified upsilon particle
UPSI(9460)	$b\bar{b}$ meson
UPSI(10025)	$b\bar{b}$ meson
UPSI(10355)	$b\bar{b}$ meson
UPSI(10575)	$b\bar{b}$ meson
UPSI(10845)	$b\bar{b}$ meson
UPSI(11020)	$b\bar{b}$ meson
VEE	unspecified neutral strange particle decay
VMESON	unspecified vector meson
WATER	water
WT	tungsten nucleus (note name not same as chemical symbol)
W+	intermediate vector boson
W-	intermediate vector boson
XE	xenon nucleus
XI	S=-2 baryon
XI/C+	baryon with quark content usc (was A ⁺)
XI/C0	baryon with quark content dsc (was A ⁰)
XI*(UNSPEC)	unspecified S=-2 baryon resonance
XI(UNSPEC)	unspecified I=1/2, S=-2 baryon resonance
XI(1530P13)	baryon resonance
XI(1820)	baryon resonance
XI(1940)	baryon resonance
XI(2220)	narrow KK meson seen in J/ ψ decay
Y0	neutral strange baryon
Y*(UNSPEC)	unspecified S=-1 baryon resonance
ZETA(8300)	meson seen in Y(9460) decay
Z0	neutral weak gauge boson
Z*(UNSPEC)	unspecified exotic S=+1 baryon resonance

INSTITUTIONS

AACH	Phys. Inst. der Tech. Hochschule	Aachen, W. Germany
AARH	Aarhus Univ.	Aarhus, Denmark
ABLC	Abilene Christian Univ.	Abilene, TX, USA
AICH	Aichi Educational Univ.	Toyota, Aichi Pref., Japan
AKIT	Akita Univ.	Akita, Japan
ALBA	State Univ. of New York at Albany	Albany, NY, USA
ALBE	Alberta Univ., NRC	Edmonton, Alb., Canada
ALMA	Kazakh Inst. for High Energy Physics	Alma-Ata, USSR
AMER	American Univ.	Washington, DC, USA
AMES	Ames Lab	Ames, Iowa, USA
AMST	Univ. of Amsterdam	Amsterdam, Netherlands
ANIK	Amsterdam Nikhef	Amsterdam, Netherlands
ANL	Argonne Nat. Lab.	Argonne, Ill., USA
ANPL	Athens Univ., Nucl. Phys. Lab.	Athens, Greece
ARIZ	Univ. of Arizona	Tucson, Ariz., USA
ATEN	Nuclear Res. Centre Demokritos	Athens, Greece
AUCK	Auckland Univ.	Auckland, New Zealand
BARI	Univ. di Bari	Bari, Italy
BASL	Basel Univ.	Basel, Switzerland
BEDF	Bedford College	London, England
BELG	Inst. Interuniv. des Sci. Nuclear	Bruxelles, Belgium
BERG	Fysisk Institut	Bergen, Norway
BERL	Inst. Hochenergiephys. DAW	Zeuthen/Berlin, E. Germany
BERN	Univ. Bern	Bern, Switzerland
BGNA	Univ. di Bologna	Bologna, Italy
BHEP	Inst. of High Energy Physics	Beijing, China
BIEL	Univ. Bielefeld	Bielefeld, W. Germany
BIRK	Birkbeck College	London, England
BIRM	Birmingham Univ.	Birmingham, England
BLOO	Bloomsburg State Coll.	Bloomsburg, PA, USA
BNL	Brookhaven National Lab.	Upton, L.I., NY, USA
BOHR	Niels Bohr Institute	Copenhagen, Denmark
BONN	Univ. Bonn	Bonn, W. Germany
BOST	Boston Univ.	Boston, Mass., USA
BRAN	Brandeis Univ.	Waltham, Mass., USA
BRAT	Inst. of Physics	Bratislava, Czechoslovakia
BRCO	British Columbia Univ.	Vancouver, Canada
BRIS	H. H. Wills Phys. Lab., U. of Bristol	Bristol, England
BROW	Brown Univ.	Providence, RI, USA
BRUX	Univ. Libre de Bruxelles	Bruxelles, Belgium
BTL	Bell Telephone Labs.	Murray Hill, NJ, USA
BUDA	Central Research Institute of Physics	Budapest, Hungary
CAEN	Lab. de Phys. Corpusculaire	Caen, France
CAGL	Calgary Univ.	Calgary, Alb., Canada
CAMB	Cambridge Univ.	Cambridge, England
CAPE	Univ. of Cape Town	Cape Town, S. Africa
CARL	Carleton Univ.	Ottawa, Canada
CASE	Case Western Reserve Univ.	Cleveland, Ohio, USA
CATH	Catholic Univ. of America	Washington DC, USA
CAVE	Cavendish Lab., Cambridge Univ.	Cambridge, England

INSTITUTIONS (CONT'D)

CBPF Centro Bras. Pesquisas Fisicas
CDEF College de France
CENG CEN, Grenoble
CERN European Org. for Nuclear Research
CHIC Univ. of Chicago
CHUO Chuo Univ.
CINC Univ. of Cincinnati
CIPP Canadian Inst. of Particle Physics
CIT Calif. Institute of Technology
CLER Univ. de Clermont-Ferrand
CLEV Cleveland State Univ.
CMU Carnegie-Mellon Univ.
CNRC Canadian National Research Council
COLC Colorado College
COLO Univ. of Colorado
COLU Columbia Univ.
COPE Copenhagen Univ.
CORN Cornell Univ.
CRAC Inst. for Nuclear Research
CRNL Chalk River Nuclear Lab.
CUNY City Univ. of New York
CURI Pierre et Marie Curie Univ., Paris VI
CWSH Central Washington Univ.
DEAJ Chungnan Univ.
DELH Univ. of Delhi
DESY Deutsches Elektronen-Synch.
DGSI Gesellschaft fur Schwerionenforschung
DLFT Technische Hogeschool
DOE Department of Energy
DORT Univ. Dortmund
DUKE Duke Univ.
DUUC University College
EDIN Univ. of Edinburgh
EFI Enrico Fermi Inst. for Nuclear Studies
ELMT Elmhurst College
EPOL Ecole Polytechnique
ERLA Univ. Erlangen
ETHZ Swiss Federal Inst. of Technology
FERR Univ. di Ferrara
FIRZ Univ. di Firenze
FKUU Fukui Univ.
FLOR Univ. of Florida
FNAL Fermi National Accelerator Lab.
FRAS Lab. Nazionali del Sincrotrone
FREI Univ. Freiburg
FRIB Univ. de Fribourg
FRNK Univ. Frankfurt
FSU Florida State Univ.
GENE State Univ. of New York, Geneseo
GENO Univ. di Genova
GESC General Electric R and D Center
 Rio de Janeiro, Brazil
 Paris, France
 Grenoble, France
 Geneva, Switzerland
 Chicago, Ill., USA
 Tokyo, Japan
 Cincinnati, Ohio, USA
 Montreal, Canada
 Pasadena, Calif., USA
 Clermont-Ferrand, France
 Cleveland, OH, USA
 Pittsburgh, PA, USA
 Ottawa, Canada
 Colorado Springs, CO, USA
 Boulder, Colo., USA
 New York, NY, USA
 Copenhagen, Denmark
 Ithaca, NY, USA
 Cracow, Poland
 Chalk River, Canada
 New York, NY, USA
 Paris, France
 Ellensburg, WA, USA
 Daejeon, Korea
 Delhi, India
 Hamburg, W. Germany
 Darmstadt, W. Germany
 Delft, Netherlands
 Washington D.C., USA
 Dortmund-Hornbruch, W. Germany
 Durham, NC, USA
 Dublin, Ireland
 Edinburgh, Scotland
 Chicago, Ill., USA
 Elmhurst, Ill., USA
 Palaiseau, France
 Erlangen, W. Germany
 Zurich, Switzerland
 Ferrara, Italy
 Firenze, Italy
 Fukui, Japan
 Gainseville, FL, USA
 Batavia, Ill., USA
 Frascati, Italy
 Freiburg, W. Germany
 Fribourg, Switzerland
 Frankfurt, W. Germany
 Tallahassee, Fla., USA
 Geneseo, NY, USA
 Genova, Italy
 Schenectady, NY, USA

INSTITUTIONS (CONT'D)

GEVA Univ. de Geneve
GLAS Univ. of Glasgow
GMAS George Mason Univ.
GREN Grenoble Univ.
GUIL Univ. of Surrey at Guilford
GWU George Washington U.
HAIF Technion - Israel Inst. of Technology
HAMB Univ. Hamburg
HARV Harvard Univ.
HAWA Univ. of Hawaii
HEFE Univ. of Science and Tech.
HEID Univ. Heidelberg
HELS Helsingin Yliopisto
HIRO Hiroshima Univ.
HOUS Univ. of Houston
HOWD Howard Univ.
IDAH Univ. of Idaho
IIT Illinois Inst. of Tech.
ILL Univ. of Illinois
ILLC Univ. of Illinois at Chicago
IND Univ. of Indiana
INNS Innsbruck Univ.
INUS Inst. for Nuclear Study at Tokyo Univ.
IOWA Univ. of Iowa
IPN Inst. de Phys. Nucleaire
ISU Iowa State Univ.
ITEP Inst. for Teor. and Exp. Physics
ITHA Ithaca College
JADA Jadavpur Univ.
JAMU Jammu Univ.
JAPN Japan Univ. Group Collaboration
JHU Johns Hopkins Univ.
JINR Joint Inst. for Nuclear Research
KANS Univ. of Kansas
KARL Technische Univ. Karlsruhe
KEK Nat. Lab for High Energy Phys., Japan
KFAJ KFA Julich
KFZK Kernforschungszentrum, Karlsruhe
KHSU Kharkov State Univ.
KIAE Kurchatov Inst. of Atomic Energy
KIEL Kiel Univ.
KIMC Industrial Medical College
KOBE Kobe Univ.
KOSI Czech. Acad. Sci. Inst. Exp. Phys.
KYOE Kyoto U. of Education
KYOT Kyoto Univ.
KYUS Kyushu Univ.
LALO Linear Accelerator Lab, Orsay
LANC Lancaster Univ.
LANL Los Alamos National Lab.
LAPP Lapp Univ.
 Geneva, Switzerland
 Glasgow, Scotland
 Fairfax, VA, USA
 Grenoble, France
 Guilford, Surrey, England
 Washington, DC, USA
 Haifa, Israel
 Hamburg, W. Germany
 Cambridge, Mass., USA
 Honolulu, Hawaii, USA
 Hefei, Anhui, China
 Heidelberg, W. Germany
 Helsinki, Finland
 Hiroshima, Japan
 Houston, Texas, USA
 Washington, DC, USA
 Moscow, ID, USA
 Chicago, Ill., USA
 Urbana, Ill., USA
 Chicago, Ill., USA
 Bloomington, Ind., USA
 Innsbruck, Austria
 Tokyo, Japan
 Iowa City, Iowa, USA
 Orsay, France
 Ames, Iowa, USA
 Moscow, USSR
 Ithaca, NY, USA
 Calcutta, India
 Jammu-Tawi, India
 Japan
 Baltimore, MD, USA
 Dubna, USSR
 Lawrence, Kansas, USA
 Karlsruhe, W. Germany
 Tsukuba-gun, Japan
 Julich, W. Germany
 Leopoldshaven, W. Germany
 Kharkov, USSR
 Moscow, USSR
 Kiel, W. Germany
 Kitakyushu, Japan
 Kobe, Japan
 Kosice, Czechoslovakia
 Kyoto, Japan
 Kyoto, Japan
 Fukuoka, Japan
 Orsay, France
 Lancaster, England
 Los Alamos, NM, USA
 Annecy, France

INSTITUTIONS (CONT'D)

LAUS	Univ. of Lausanne	Lausanne, Switzerland
LBL	Lawrence Berkeley Lab.	Berkeley, Calif., USA
LEBD	Lebedev Physics Inst.	Moscow, USSR
LEHI	Lehigh Univ.	Bethlehem, PA, USA
LEMO	Le Moyne College	Syracuse, NY, USA
LENI	Inst. of Nucl. Phys., Akad. Nauk USSR	Leningrad, USSR
LIBH	Lab Interuniv. Belge High Energy	Brussels, Belgium
LISB	Nova Univ. de Lisbon	Lisbon, Portugal
LIVP	Liverpool Univ.	Liverpool, England
LJUB	Univ. of Ljubljana	Ljubljana, Yugoslavia
LLL	Lawrence Livermore Lab.	Livermore, Calif., USA
LOIC	Imperial Col. of Science and Tech.	London, England
LOQM	Queen Mary College	London, England
LOUC	University College	London, England
LOWC	Westfield College	London, England
LPGP	Lab. de Phys. General, Univ. Paris	Paris, France
LSBF	Lisbon Inst. Fisica	Lisbon, Portugal
LSU	Louisiana State Univ.	Baton Rouge, LA, USA
LUMI	Centre Univ. de Luminy	Marseille, France
LUND	Lund Univ.	Lund, Sweden
LVLN	Univ. Catholique de Louvain	Louvain-la-Neuve, Belg.
LYON	Inst. de Phys. Nucl., Univ. de Lyon	Villeurbanne, France
MADR	Junta de Energia Nuclear	Madrid, Spain
MANI	Univ. of Manitoba	Winnipeg, Canada
MANZ	Univ. Mainz	Mainz, W. Germany
MARB	Univ. Marburg	Marburg/Lahn, W. Germany
MASA	Univ. of Massachusetts	Amherst, Mass., USA
MCGI	McGill Univ.	Montreal, Canada
MCHS	Univ. Manchester	Manchester, England
MCPT	Meiji College of Pharmacy	Tokyo, Japan
MELB	Univ. of Melbourne	Parkville, Vict., Australia
MEXU	Univ. Nac. Autonoma de Mexico	Mexico City, Mexico
MIAM	Miami Univ.	Miami, FL, USA
MICH	Univ. of Michigan	Ann Arbor, Mich., USA
MILA	Univ. di Milano	Milano, Italy
MINN	Univ. of Minnesota	Minneapolis, Minn., USA
MINR	Institute for Nuclear Research	Moscow, USSR
MISS	Univ. of Mississippi	University, Miss., USA
MIT	Massachusetts Inst. of Technology	Cambridge, Mass., USA
MONS	Univ. de l'Etat, Mons	Mons, Belgium
MONT	Montreal Univ.	Montreal, Que., Canada
MOSU	Moscow State Univ. Inst. of Nucl. Phys.	Moscow, USSR
MPEI	Moscow Phys. Eng. Inst.	Moscow, USSR
MPIH	Max-Planck-Inst. fur Phys.-Astrophys.	Heidelberg, W. Germany
MPIM	Max-Planck-Inst. fur Phys.-Astrophys.	Munich, W. Germany
MSU	Michigan State Univ.	East Lansing, Mich., USA
MTHO	Mt. Holyoke College	South Hadley, Mass., USA
MTU	Univ. of Montana	Missoula, Mont., USA
MUNI	Munich Univ.	Munich, W. Germany
MUNT	Technische Univ. Munich	Munich, W. Germany
NAGM	Nagoya Univ. Coll. Medical Tech.	Nagoya-shi, Aichi, Japan

INSTITUTIONS (CONT'D)

NAGO	Nagoya Univ.	Nagoya, Japan
NANC	Univ. de Nancy	Nancy, France
NAPL	Univ. di Napoli	Napoli, Italy
NARA	Nara Women's Univ.	Nara, Japan
NARU	Nara Univ.	Nara, Japan
NDAM	Univ. of Notre Dame	Notre Dame, Ind., USA
NEAS	Northeastern Univ.	Boston, Mass., USA
NEUC	Univ. of Neuchatel	Neuchatel, Switzerland
NEVI	Nevis Lab.	Irvington-on-Hudson, NY, USA
NIFS	Ist. di Fis. Sperimentale	Napoli, Italy
NIHN	Nihon Univ.	Tokyo, Japan
NIIG	Niigata Univ.	Niigata, Japan
NIJM	R. K. Univ. Nijmegen	Nijmegen, Netherlands
NILU	Northern Illinois Univ.	Dekalb, Ill., USA
NMXS	New Mexico State Univ.	Las Cruces, NM, USA
NNIK	Nijmegen NIKHEF	Nijmegen, Netherlands
NOVO	Inst. of Nuclear Physics	Novosibirsk, USSR
NRDG	Cal State Univ.	Northridge, Calif., USA
NRL	Naval Research Laboratory	Washington, D.C., USA
NTUA	National Technical Univ. of Athens	Athens, Greece
NWES	Northwestern Univ.	Evanston, Ill., USA
NYU	New York Univ.	New York, NY, USA
OKAY	Okayama Univ.	Okayama, Japan
OKLN	Oklahoma Univ.	Norman, OK, USA
OPEN	Open Univ.	Milton Keynes, England
OREC	Oregon State Univ.	Corvallis, OR, USA
ORNL	Oak Ridge National Lab.	Oak Ridge, Tenn., USA
ORSA	Univ. de Paris, Fac. des Science	Orsay, France
OSAK	Osaka Univ.	Osaka, Japan
OSKC	Osaka City Univ.	Osaka, Japan
OSLO	Oslo Univ.	Oslo, Norway
OSSE	Science Educ. Inst. of Osaka Pref.	Osaka, Japan
OSU	Ohio State Univ.	Columbus, Ohio, USA
OTTA	Univ. of Ottawa	Ottawa, Canada
OXF	Oxford Univ.	Oxford, England
PADO	Univ. di Padova	Padova, Italy
PAVI	Univ. di Pavia	Pavia, Italy
PENN	Univ. of Pennsylvania	Philadelphia, PA, USA
PERG	Univ. di Perugia	Perugia, Italy
PISA	Univ. di Pisa	Pisa, Italy
PITT	Univ. of Pittsburgh	Pittsburgh, PA, USA
PRAG	Institute of Physics, CSAV	Prague, Czechoslovakia
PRIN	Princeton Univ.	Princeton, NJ, USA
PSU	Pennsylvania State Univ.	Fogelsville, PA, USA
PURD	Purdue Univ.	Lafayette, Ind., USA
QUNK	Queen's Univ.	Kingston, Ont., Canada
REHO	Weizmann Inst. of Science	Rehovoth, Israel
RHEL	Rutherford High Energy Lab.	Chilton, Did., Oxon., England
RHLC	Royal Holloway College	Egham Hill, Surrey, England
RICE	William Marsh Rice Univ.	Houston, Texas, USA
RIKK	Rikkyo University	Rikkyo, Japan

INSTITUTIONS (CONT'D)

RISO	RISO Natioanl Lab	Roskilde, Denmark
ROCH	Univ. of Rochester	Rochester, NY, USA
ROCK	Rockefeller Univ.	New York, NY, USA
ROMA	Univ. di Roma	Roma, Italy
ROSS	Zentralinst. fur Kernforschung	Rosendorf, E. Germany
RUTG	Rutgers Univ.	New Brunswick, NJ, USA
SACL	Center d'Etudes Nuclear Saclay	Gif-sur-Yvette, France
SACR	Cal State, Sacrament	Sacramento, CA, USA
SAGA	Saga Univ.	Saga, Japan
SAIT	Saitama Univ.	Saitama, Japan
SANI	Ist. Superiore di Sanita	Rome, Italy
SANT	Univ. de Santander	Santander, Spain
SASK	Univ. of Saskatchewan	Saskatoon, Canada
SCUC	Univ. ov. at Seoul	Seoul, S. Korea
SERP	Inst. of High Energy Physics	Serpukhov, USSR
SHAN	Shandoong Univ.	Jinan, Shandong, China
SHEF	Univ. of Sheffield	Sheffield, Yorks., England
SHMP	Univ. of Southampton	Southampton, England
SIEG	Siegen Univ.	Siegen, W. Germany
SLAC	Stanford Linear Accel. Center	Stanford, Calif., USA
SMAS	Southeastern Massachusetts Univ.	North Dartmouth, Mass., USA
SOFC	High Inst. of Chem. Tech.	Sofia, Bulgaria
SOFI	Bulgarian Acad. of Science	Sofia, Bulgaria
SRIP	State Res. Inst. Photochem. Proj.	Moscow, USSR
STAN	Stanford Univ.	Stanford, Calif., USA
STEV	Stevens Inst. of Tech.	Hoboken, NJ, USA
STOH	Stockholm Univ.	Stockholm, Sweden
STON	State Univ. of New York at Stonybrook	Stonybrook, LI, NY, USA
STRB	Centre des Res. Nucleaires	Strasbourg, France
SWRK	Inst. of Nuclear Research	Swierk, Poland
SYDN	Univ. of Sydney	Sydney, Australia
SYRA	Syracuse Univ.	Syracuse, NY, USA
TAMU	Texas A and M Univ.	College Station, TX, USA
TATA	Tata Inst. of Fundamental Research	Bombay, India
TBSU	Tbilisi State Univ.	Tbilisi, USSR
TELA	Univ. of Tel-Aviv	Tel-Aviv, Israel
TEMP	Temple Univ.	Philadelphia, PA, USA
TENN	Univ. of Tennessee	Knoxville, Tenn., USA
TEXA	Univ. of Texas at Austin	Austin, TX, USA
THES	Univ. of Thessaloniki	Thessaloniki, Greece
TMSK	Nucl. Phys. Inst., Tomsk Polytech. Inst.	Tomsk, USSR
TMU	Tokyo Metropolitan Univ.	Tokyo, Japan
TNTO	Univ. of Toronto	Toronto, Canada
TOCR	Cosmic Ray Lab, Tokyo Univ.	Tokyo, Japan
TOGA	Tohoku-Gakuin Univ.	Miyagi, Japan
TOHO	Tohoku Univ.	Sendai, Japan
TOIN	Tokyo Inst. Tech.	Tokyo, Japan
TOKY	Univ. of Tokyo	Tokyo, Japan
TORI	Univ. di Torino	Torino, Italy

INSTITUTIONS (CONT'D)

TRIU	TRIUMF, Univ. of British Columbia	Vancouver, Canada
TRST	Univ. di Trieste	Trieste, Italy
TSUK	Tsukuba Univ.	Ibaraki, Japan
TUAT	Tokyo Univ. of Agriculture and Tech.	Tokyo, Japan
TUFT	Tufts Univ.	Medford, Mass., USA
UATH	Univ. of Athens	Athens, Greece
UBEL	Univ. of Belgrade	Belgrade, Yugoslavia
UCB	Univ. of Calif. at Berkeley	Berkeley, Calif., USA
UCD	Univ. of Calif. at Davis	Davis, Calif., USA
UCI	Univ. of Calif. at Irvine	Irvine, Calif., USA
UCLA	Univ. of Calif. at Los Angeles	Los Angeles, Calif., USA
UCR	Univ. of Calif. at Riverside	Riverside, Calif., USA
UCSB	Univ. of Calif. at Santa Barbara	Santa Barbara, Calif., USA
UCSC	Univ. of Calif. at Santa Cruz	Santa Cruz, Calif., USA
UCSD	Univ. of Calif. at San Diego	La Jolla, Calif., USA
UMAD	Univ. de Madrid	Madrid, Spain
UMD	Univ. of Maryland	College Park, MD, USA
UNM	Univ. of New Mexico	Albuquerque, New Mex., USA
UTAH	Univ. of Utah	Salt Lake City, Utah, USA
UTRE	University of Utrecht	Utrecht, Netherlands
UUPP	Univ. of Uppsala	Uppsala, Sweden
VALE	Univ. de Valencia	Valencia, Spain
VALI	Valparaiso Univ.	Valparaiso, IN, USA
VAND	Vanderbilt Univ.	Nashville, Tenn., USA
VASC	Virginia State Coll.	Petersburg, VA, USA
VASS	Vassar College	Poughkeepsie, NY, USA
VICT	Victoria Univ.	Victoria, BC, Canada
VIEN	Inst. for High En. Phys., A. A. S.	Vienna, Austria
VILL	SIN, Villigen Univ. High Energy Physics	Villigen, Switzerland
VIRG	Univ. of Virginia	Charlottesville, VA, USA
VIRK	Inst. fur Radiumforschung und Kernphysik	Vienna, Austria
VPI	Virginia Polytechnic Inst.	Blacksburg, VA, USA
VRIJ	Vrije Univ.	Amsterdam, Netherlands
WABE	Eidgenossisches Amt fur Messwesen	Wabern, Germany
WARS	Univ. of Warsaw	Warsaw, Poland
WASH	Univ. of Washington	Seattle, Wash., USA
WIEN	Univ. Wien	Vienna, Austria
WILL	College of William and Mary	Williamsburg, VA, USA
WINR	Warsaw Inst. of Nuclear Research	Warsaw, Poland
WISC	Univ. of Wisconsin	Madison, Wisc., USA
WSUP	Washington State Univ.	Pullman, WA, USA
WUPP	Univ. Wuppertal	Wuppertal, W. Germany
WURZ	Wurzburg Univ.	Wurzburg, W. Germany
WYOM	Univ. of Wyoming	Laramie, Wyoming, USA
YALE	Yale Univ.	New Haven, Conn., USA
YERE	Yerevan Physics Inst.	Yerevan, Armenia, USSR
YOKO	Yokohama National Univ.	Yokohama, Japan
YORK	York University	Downsview, Ont., Canada
ZAGR	Inst. Ruder Boskovic, Zagreb	Zagreb, Yugoslavia
ZURI	Zurich University	Zurich, Switzerland

BROOKHAVEN AGS BEAMS (Source: G. Bunce, BNL)

Up to 10^{13} protons per pulse are accelerated typically to 28.5 GeV kinetic energy (31 GeV has been obtained). At 28.5 GeV, the period is 2.4 sec for slow extraction (with a 1-sec flattop), or 1.4 sec for fast extraction (used for neutrino beams). Counting rates may be estimated using the nominal beam spill time of 1 sec.

Beam	Momentum range (GeV/c)	$\pm \Delta p/p$ (%)	Production angle (°)	Solid angle (msr)	Beam length (m)	Particles	Flux in thousands per 10^{12} protons → on target	at (GeV/c)	Comments
B4	1.5-6 1.5-9	3	3	0.3	81	K^+/K^- \bar{p} π^+/π^-	270/120 100 $4 \times 10^4/3 \times 10^4$	4	Usually 2×10^{12} ppp on target; $\pi/K \sim 3$ in K beam; $\pi/\bar{p} \sim 3/4$
B2	- same characteristics as B4 above -								To multiparticle spectrometer
C2, C4	≤ 1.1	2	10.5	2.6	15	K^+/K^- \bar{p} π^+/π^-	40/12 2 8×10^4	0.75	Usually 2×10^{12} ppp; $\pi/K \sim 10$ in K beam
C6, C8	≤ 0.8	2.5	5	15	15	K^+/K^- \bar{p} π^+/π^-	200/60 14 6×10^5	0.75	Usually 2×10^{12} ppp; $\pi/K \sim 20$
A1	5-24	1.5	0	0.2	130	π^-	1000	22	To multiparticle spectrometer; 10^{12} ppp; 25 cm Be target
B1	5-24	3	0	0.3	75	K^+/K^- p/\bar{p} π^+/π^-	2500/700 $1.5 \times 10^5/200$ $6 \times 10^4/3 \times 10^4$	10	Usually 2×10^{12} ppp
C1	5-24	5	0	0.8	61	K^+/K^- p/\bar{p} π^+/π^-	9000/400 $3 \times 10^4/30$ $10^5/3 \times 10^4$	16	Usually 2×10^{12} ppp; $\mu/\pi \sim 3\%$ in π beam; also runs at lower momenta (1.4 GeV/c)
D2	0.1-0.3(π) 0.05-0.15(μ)	9(π)	55(π)	50(π)	9	μ^-	2000	0.10	Muon channel; flux in 100 cm^2 with $\Delta p/p = \pm 2\%$; design intensity
A3	1-28		0	0.0045	8	K_L n	2000 10^5	1-28	Typically 10^{12} ppp; alternates with A1
B5	1-28		0	0.01	2.6	n	10^5	1-28	Typically 10^{10} ppp; design intensity
U	1.5 (peak)					$\nu/\bar{\nu}$	$10^7/7 \times 10^6$ per m^2		Typically 1.2×10^{13} ppp; flux averaged over 0.7 m radius; narrow band beam also available

Separated

Unseparated

Neutral

CERN PS BEAMS [Source: *Experiments at CERN in 1984* (M. Ferro-Luzzi, editor)]

East Area – The primary beam.

Beam	Momentum (GeV/c)	Particles	Flux/cycle	Comments
e_{17}	8-24	p	2×10^{11}	Slow ejection; splits into two branches

East Area – These are counter beams fed by branches of the e_{17} beam above. The fluxes are for $\Delta p/p = \pm 1\%$ and 10^{11} 24-GeV/c protons on the external target; they assume 30% target efficiency (fluxes also depend on the external target used).

Beam	Momentum (GeV/c)	Particles	Flux/cycle	Comments
t_7	1-10	p, π^+ , e^+ or π^- , e^-		e^+ is 7% of + beam at 5 GeV/c, 50% at 2 GeV/c
t_9	≤ 10	π^- e^- positives	$\geq 10^5$ at 10 GeV/c 1-3%* $\approx 4 \times 10^5$	Production angle 0° ; beam height 2.28 m
t_{10}	≤ 5	π^- e^- positives	$\approx 3 \times 10^5$ at 5 GeV/c $\approx 10\%*$ $\approx 6 \times 10^5$	Production angle 3.53° ; beam height 2.5 m
t_{11}	≤ 3.5	π^- e^- positives	$\approx 2 \times 10^5$ at 3.5 GeV/c $< 10\%*$ $\approx 4 \times 10^5$	Production angle 8.55° ; beam height 2.5 m

 *The e^- percentage in the negative beam depends on the external target used.

South Area (LEAR) – Design values. The \bar{p} beam splits into three branches (six experimental areas).

Beam	Momentum range (GeV/c)	Flux (per sec)	Comments
External \bar{p} beam, with ultra-slow ejection (≈ 1 hr)	0.2-1.5 0.1-2.0	$\leq 10^6$	A long spill of $\leq 3 \times 10^9$ \bar{p}

CERN SPS BEAMS [Source: *Experiments at CERN in 1984* (M. Ferro-Luzzi, editor)]

North Area Beams (NA experiments)

Beam	Maximum momentum (GeV/c)	Maximum intensity for 10^{12} protons at 450 GeV/c	Beam type
H2	400	$9 \times 10^7 \pi^+$ at 200 GeV/c $3 \times 10^7 \pi^-$ " " " $4 \times 10^6 e^\pm$ at 150 " "	High energy hadrons or electrons (also enriched K^+/\bar{p})
H4/E4	330	$6 \times 10^7 \pi^+$ at 200 GeV/c $2 \times 10^7 \pi^-$ " " " $1 \times 10^6 e^\pm$ " " "	High energy hadrons or electrons
K4	~200	$1 \times 10^5 K_L^0/10^{11}$ incident p $1 \times 10^2 K_S^0/10^7$ " " "	Alternate K_L^0/K_S^0 beam
H6	250	$1 \times 10^8 \pi^+$ at 150 GeV/c $4 \times 10^7 \pi^-$ " " "	Medium energy hadrons
H8	400	$2 \times 10^8 \pi^+$ at 200 GeV/c $7 \times 10^7 \pi^-$ " " "	High energy hadrons (electrons)
M2	325	$2.5 \times 10^7 \mu^+$ at 200 GeV/c $8 \times 10^6 \mu^-$ " " "	High intensity muons
P0	450	$\sim 10^{13}$ p at 450 GeV/c	High intensity primary protons for production of H10 or E12
H10	400/450	$2 \times 10^9 \pi^+$ at 200 GeV/c $7 \times 10^8 \pi^-$ " " "	High energy high-intensity hadrons or protons
E12	300	$1.5 \times 10^8 e^-$ total with energy > 100 GeV	Broad-band electrons/photons

West Area Beams (WA experiments) The table below gives some calculated properties of the upgraded beams.

Beam	Maximum momentum (GeV/c)	Intensity for 10^{12} protons at 450 GeV/c	Beam type
H1	450	$4 \times 10^6 \pi^-$ at 350 GeV/c $2 \times 10^8 \pi^+$ at 200 " $1.5 \times 10^6 e^\pm$ " " "	Hadrons, electrons, or attenuated protons
H3	450	$2 \times 10^6 \pi^-$ at 350 GeV/c $1 \times 10^8 \pi^+$ at 200 " $7 \times 10^5 e^\pm$ " " "	Hadrons, electrons, or attenuated protons
X3	50	10^3-10^4 tertiaries/ 10^7 incident particles from H3	Test beam; tertiary electrons & hadrons
X5	100	10^3-10^4 tertiaries/ 10^7 incident particles from H3	Test beam; tertiary electrons & hadrons
X7	100	10^3-10^4 tertiaries/ 10^7 incident particles from H3	Test beam; tertiary electrons & hadrons

CERN SPS BEAMS [Source: *Experiments at CERN in 1984* (M. Ferro-Luzzi, editor)]

West Area Neutrino Beams (WA experiments) -- Reference: CERN/EF/BEAM 80-7, A. Grant, High momentum version of the narrow-band neutrino beam N3, and CERN/EF/BEAM 83-2, A. Grant and J.M. Maugain, High intensity version of beam N3.

Beam	Parent momentum (GeV/c)	Particle	Flux for 10^{13} incident protons [†]	$\langle E_\nu \rangle$ (GeV)	σ_{rms} on E_ν (GeV)	Beam type
N1	450 protons	ν	$5.3 \times 10^{10}/\text{m}^2$ (~ 0.25 ev/ton)	~ 30		Wide-band spectrum up to 450 GeV
		$\bar{\nu}$	$2.3 \times 10^{10}/\text{m}^2$ (~ 0.025 ev/ton)	~ 30		
N3	380 secondaries	ν_π	1.19×10^7	88	41	Narrow-band dichromatic beam with 450 GeV primary protons
		ν_K	5.4×10^6	259	49	
	350	$\bar{\nu}_\pi$	1.4×10^7	82	37	
		$\bar{\nu}_K$	1.7×10^5	248	48	
		ν_π	3.8×10^7	80	38	
		ν_K	2.5×10^7	251	45	
	320	$\bar{\nu}_\pi$	3.2×10^7	78	35	
		$\bar{\nu}_K$	7.2×10^5	224	49	
		ν_π	1.1×10^8	78	34	
		ν_K	8.5×10^7	228	45	
	300	$\bar{\nu}_\pi$	5.3×10^7	74	32	
		$\bar{\nu}_K$	1.7×10^6	220	37	
		ν_π	1.9×10^8	73	32	
		ν_K	1.2×10^8	220	41	
	275	$\bar{\nu}_\pi$	1.1×10^8	68	29	
		$\bar{\nu}_K$	3.4×10^6	215	34	
200	$\bar{\nu}_\pi$	4.2×10^8	55	19		
	$\bar{\nu}_K$	1.8×10^7	167	26		
	ν_π	1.0×10^9	54	20		
	ν_K	2.4×10^8	165	20		
160	$\bar{\nu}_\pi$	8.0×10^8	47	14.5		
	$\bar{\nu}_K$	1.8×10^7	141	15		
	ν_π	1.9×10^9	46.5	14.7		
	ν_K	2.4×10^8	141	15		

[†]Fluxes for the N3 beam are at the WA1 (CDHS) detector in a circle of diameter 1.5 m.

FERMILAB BEAMS (Source: H.B. White, Jr., FNAL)

Currently, protons are accelerated to an operational momentum of 800 GeV/c. The maximum intensity is 1×10^{13} protons per pulse, the current repetition rate is 0.017/sec, and the beam spill time is 20 sec. Maximum design momentum is 1000 GeV/c.

Beam	Momentum range (GeV/c)	$\pm \Delta p/p$ (%)	Production angle (mr)	Solid angle (μsr)	Particles	Flux in thousands per sec per 10^{12} protons on target	→ at (GeV/c)	Comments
PW	300 (peak)	5	1.5		π^-	2×10^6	300	High intensity pion beam
					\bar{p}	10^4	300	P-west secondary beam
*PB	600 (peak)	15		4	e^-	10^4	600	Wide band charged and neutral beam Also capable of K_L^0 , p, and π^-
					γ	8×10^3	>200	
					n	6×10^5	~750	
PE	300 (peak)	2.3	0-2	1.2	e^-	10^4	200	Also provides tagged photons
	300 (peak)		0	0.04	n	4000	>100	Also tagged photons
	300		2		π^-	8×10^4	300	
*PC	100-350		± 7.5		Σ^-	2000		P-center charged hyperons
					Ω^-, Λ	<50		
PC	800		0	0.01-0.45	n	10^4		P-center neutral beam
					K_S^0	<50		
					K_L^0	<50		
ME	800 (peak)	1.0			p	$\sim 2 \times 10^9$	800	Primary protons
*MP	70-350	0 ± 5.0	0 ± 1.0		p	10^5	600	Polarized protons from 1000 GeV/c primary Antiprotons from 1000 GeV/c primary Also capable of unpolarized transport
	1000				\bar{p}	<7000	200	
MC	50-150		0-3		K_L^0	2×10^5	100	Neutral beam with 1000 GeV/c primary variable
					n	7×10^5		
MB	200 (peak)	± 4.0		2.5	π, K	15×10^4	75-100	Low intensity wide-angle test beam
					e^\pm	9	100	
MT	800				p	10^9	800	Primary protons (intensity limited) Calibration beam mode
					μ^\pm			

continued on next page

FERMILAB BEAMS (continued)

Beam	Momentum range (GeV/c)	$\pm \Delta p/p$ (%)	Production angle (mr)	Solid angle (μsr)	Particles	Flux in thousands per sec per 10^{12} protons on target	→ at (GeV/c)	Comments
*MW	1000 (peak)	10	0 ± 0.7		p	6×10^6	600	Beam transport to possible new multiparticle spectrometer; assumes 1000 GeV/c on target
					π^+	5×10^5	600	
					K^+	10^5	600	
					π^-	3×10^5	600	
					K^-	10^4	500	
					\bar{p}	10^4	300	
NW	10-150	2	0-1	4-16	μ^+			Currently a test beam, intensity limited
					π^+	40	~50	
					e^-	~10	~50	
*NC-D	750 (peak)		0		$\nu/\bar{\nu}$	variable		Narrow band, sign-selected neutrino beam
*NC-T	1000 (peak)		0		$\nu/\bar{\nu}$	variable		Broad band, quadrupole focus
NE	800		0		p	$\sim 10^6$	800	To hybrid spectrometer system and Lab G
NT-west	450		0-3		hadrons	$\sim 10^5$	450	Test beam to Lab E neutrino detector and Lab B
NT-east	450		0-3		hadrons	$\sim 10^5$	450	Test beam to Lab C neutrino detector Muons also available
*NP	1000		0		p	$\sim 10^{10}$	1000	Proton transport to prompt neutrino detector
*NM	275-750	20			μ^\pm	$\sim 10^4$	750	Tevatron muon beam

*These beams will be commissioned as part of the Tevatron II project. Design characteristics are shown; detailed characteristics will be determined in operation. These beams will also replace present beams in most cases.

KEK BEAMS (Source: H. Hirabayashi, KEK)

Protons are accelerated to a maximum momentum of 13 GeV/c. The maximum intensity is 4.0×10^{12} protons per pulse. The repetition rate is 0.45/sec.

Beam	Momentum range (GeV/c)	$\pm \Delta p/p$ (%)	Production angle (°)	Solid angle (msr)	Beam length (m)	Particles	Typical flux in particles per pulse	→ at (GeV/c)	Comments
EP1	4-13					p	5×10^{10}		Fast extraction
EP2	4-13					p	2×10^{12}		Slow extraction; branches feed the $\pi 1$, T1, K2, K3, and π - μ beams
$\pi 1$	4-8	2	1.5	0.33	33	π^+/π^-	$2 \times 10^6/6 \times 10^5$	8	Superconducting septum and bending magnets
$\pi 2$	2-4.3	1	10	0.594	31.3	p/\bar{p} π^+/π^-	$10^5/10^2$ $2 \times 10^5/1 \times 10^5$	3	Internal target beam; fluxes for 10^{11} ppp
T1	0.5-2.3	2	23	0.16	18.8	π^+/π^-	$5 \times 10^4/4 \times 10^3$	1	Internal target test beam; fluxes for 10^{11} ppp
T2	0.5-6.0	4	15	0.35	37.0	π^+/π^-	10^4	4	Test beam
K2	1-2	3	0	1.02	27.9	K^+/K^- p/\bar{p} π^+/π^-	$1.5 \times 10^5/5.7 \times 10^4$ $2 \times 10^7/1.2 \times 10^4$ $1.7 \times 10^7/1.4 \times 10^7$	2	
K3-S (K3-L)	0.5-1.0 "	2 "	0 "	7.3 (3.0)	14.4 (16.5)	K^+/K^- p/\bar{p} π^+/π^-	$4.2 \times 10^4/1.0 \times 10^4$ $7 \times 10^7/3.5 \times 10^2$ $5 \times 10^7/5 \times 10^7$	0.6 0.8 0.8	Fluxes are for the S (short) mode of operation
K4	0.4-0.8	3	0	7.3	28.5	\bar{p}	700	0.6	Branch of K3
π - μ	0.1-0.45		87	20		π^\pm μ^\pm	10^6 10^4	0.15	

LAMPF PARTICLE PHYSICS BEAMS (Source: D. Dodder, Los Alamos)

The primary 800 MeV H^+ beam normally runs with an average current up to 900 μA , but 1.2 mA has been achieved. The macro duty factor is up to 10.5%, with a macrostructure of 120 pps. Each macropulse consists of a 0.25 ns burst every 5 ns. This beam is used to generate the meson and neutrino beams described below, as well as additional beams for other purposes. Simultaneously with the H^+ beam a low current (5 μA unpolarized; up to 25 nA polarized) H^- beam is accelerated to a desired energy between 212 and 800 MeV.

Beam	Momentum (MeV/c)	$\pm \Delta p/p$ (%)	Solid angle (msr)	Particle	Flux in particles/sec or current	→ at (MeV/c)	Comments	
A	1460	0.1		p	900 μA	1460	Main beam; 1.2 mA has been achieved	
LEP	77-415	0.05-2.8	0-17	π^+ π^-	9×10^8 $\sim 2 \times 10^8$	195	Low energy pion beam; achromatic; flux at $\Delta p/p = 2.8\%$	
EPICS	156-415	2.0	3.4	π^+ π^-	1.9×10^8 4.2×10^7	300	Energetic pion channel and spectrometer	
P ³	100-750	5.0	7.0	π^+	2×10^9	470	High energy pions; achromatic	
	"			π^-	3×10^8	470		
	28			μ^+	1.9×10^6	28	μ^- flux is without degrader	
	100			μ^-	1.0×10^6	100		
Stopped muon	25-250			μ^+ μ^-	1.8×10^8 3.6×10^7	130		
	665-1460			p	6 μA	1460	Current reduced to 1/3 for <1460 MeV/c Polarization = 0.8 N,L,S available "Unpolarized" beam has P = 0.2 at 20° Polarization = 0.5; max 0° energy is given; other ports up to 37° give lower energies	
	"		\bar{p}	25 nA				
	<1460	0.8		n	10^7			
	"	0.8		\bar{n}	10^4			
External proton beam	665-1460	<0.1	<6	p	<100 nA	1460	H^- beam stripped to H^0 or H^+	
	"			H^0	"			
	"			H^-	"			
	"			\bar{p}	10 nA			Polarization = 0.8 N,L,S available Independent of polarization direction of internal beam
	"			\bar{H}^0	"			
"	\bar{H}^-	"						
Area C HRS	475-1460	0.26		p	100nA		For high resolution proton spectrometer	
				\bar{p}	10nA			
Neutrino facility	0-53		$\sim 4\pi$ sr	ν_e	3×10^{14}	total	Peak momentum is 35 MeV/c for ν_μ Flux at 8 m is 4×10^8 ν/cm^2 -sec Source subtends $\pm 1.5^\circ$ for target 8 m away	
				ν_μ	"			
				$\bar{\nu}_\mu$	"			
Neutrino line E	0-300			$\bar{\nu}_\mu$		total	Peak momentum is 150 MeV/c; flux at 25 m is 1.4×10^5 ν/cm^2 -sec	

Main exp. area

Area B

Area C

SERPUKHOV BEAMS (Source: N.A. Galiaev and R.A. Rzaev, Serpukhov)

Protons are accelerated to a maximum momentum of 70 GeV/c. The intensity is about 3×10^{12} protons per pulse. The repetition rate is 0.115/sec, and the beam spill time is about 2 sec.

Beam	Momentum range (GeV/c)	$\pm \Delta p/p$ (%)	Production angle (mr)	Solid angle (μsr)	Beam length (m)	Particles	Typical flux in particles per pulse	→ at (GeV/c)	Comments
2/14	30-70	1	6-35	10	120	hadrons+	10^6	60	Internal target lines
	30-60	1	0-5	30		hadrons-	10^6	60	2A, 2B, 14; the e^- 's may be used for polarized γ 's
	5-45	3	0-7	30		e^-	10^6	30	
4	20-50	1	0-5	40	130	hadrons-	6×10^6	40	Internal target lines 4A, 4B, 4V, 4L, 4E
18	3-17	2	0-200	120	50	hadrons+	10^8	5	Internal target, injection in ring
	2-14	2	240-400	80		hadrons-	10^4	8	
21	70		0		180	p	10^{11}	70	Slow ejection
	7-70	2.5	0	60	110	hadrons+ hadrons-	6×10^7 2×10^7	35 35	External target Slow ejection
19	70		0			p	10^{12}	70	Slow ejection
	70		0.5-5			p	10^6-10^{10}	70	Internal target
4N	≤ 70		12	1	40	neutrals	10^7	total	Internal target
7	30-70	0.25	11.5	1-4	511.5	p	10^6	69	Internal target, unseparated
	20-50	0.25	0	40		π^+, K^\pm, \bar{p}			Fast ejection, separated
	20-55	0.25	0	10		π^-			to bubble chamber
9	<25	0.5	0	30	194	$\pi^\pm, K^\pm, \bar{p}, d$	5		Fast ejection, separated
	10-13	1	0	30		\bar{d}	0.8	12.2	Separated
8	<40 (mean=6)		0	5000	500	$\nu, \bar{\nu}$	5×10^9	total	Wide-band neutrino beam
	70		0			p	10^{12}	70	Slow ejection

SIN BEAMS (Source: R. Frosch, SIN)

The average energy of the primary proton beam is 589 MeV with a FWHM spread of 0.4 %. The pulse rate is 5×10^7 per sec and the pulse width is 1 nsec. The maximum intensity at extraction is expected to be about 300 μA in 1985. Secondary beam rates given below are for $I_p = 100 \mu\text{A}$

Pion Beams

Beam	Energy range (MeV)	Minimum $\pm \Delta p/p$ (%)	Maximum flux (per sec)	for maximum flux		
				Energy (MeV)	$\pm \Delta p/p$ (%)	FWHM spot size H×V (cm)
πE1	50-350	0.2	π^+ 9×10^9 π^- 8×10^8	225	2.5	2×5
πE3	8-125	1.0	π^+ 7×10^8 π^- 1.3×10^8	85	5.0	5.6×2.6
πM3	8-350	0.1	π^+ 2.7×10^9 π^- 2.4×10^7	225	3.0	4×2
πM1	50-350	0.05	π^+ 3×10^7 π^- 3×10^6	225	1.0	0.9×0.7

Muon Beams (μ^+ fluxes are 4 or 5 times μ^- fluxes)

Beam	Momentum (MeV/c)	μ^- flux (per sec)	Δ -range (g/cm)	Stop density μ^- (stops/g-sec)	e^-/μ^- ratio	Burst width (nsec)	FWHM spot size H×V (cm)
μE1	120-50	3×10^7 - 4×10^5	4-0.3	1×10^5 - 3×10^4	0.01-3	≥ 4	6×4
μE2	125-50	10^7 - 10^5	2-0.15	4×10^4 - 1×10^4	0.01-3	≥ 4	10×6
μE3	stopping			3.5×10^6			
μE4	stopping			2×10^5	$0.3(\pi^-/\mu^-)$		
πE3	28	$10^7(\mu^+)$	0.04	$2 \times 10^7(\mu^+)$	$0.1(e^+/\mu^+)$		5×4

Neutron Beam (nE1)

Energy range (MeV)	Intensity in 25 cm^2 spot (per MeV-sec)	Available flight path (m)	Resolution from T.O.F. at 590 MeV (MeV)
590-200	4×10^5 - 1.4×10^5	60	7

SLAC BEAMS (Source: T. Fieguth, SLAC)

Accelerator mode	Particles	Momenta (GeV/c)	Particles per pulse	Pulse length (μ s)	Repetition rate (Hz)	Comments
Normal	e^-	≤ 23.5	$\leq 5 \times 10^{11}$	1.6	≤ 360	To conserve power, repetition rates rarely exceed 180 Hz. The e^+ beam would require reinstallation of a high-power source.
	e^+	≤ 15.0	$\leq 2 \times 10^{10}$	1.6	≤ 90	
SLED	e^-	≤ 33.5	10^{11}	0.2	≤ 360	Sector 25 off-axis injector
NPI	e^-	≤ 4	$\leq 8 \times 10^{11}$	1.6	≤ 180	

Colliding beams	Particles	C.m. energy (GeV)	Peak luminosity ($\text{cm}^{-2} \text{sec}^{-1}$)	Average luminosity ($\text{cm}^{-2} \text{sec}^{-1}$)	Comments
SPEAR	e^+e^-	2-7.4	2×10^{31} at 6.4 GeV	1×10^{30} at 3.7 GeV	SPEAR has 2 interaction regions, PEP has 6. At PEP, the luminosity scales as E^{-2} (E^{-3}) for c.m. energies below (above) that at the peak.
PEP	e^+e^-	8-36	3.2×10^{31} at 29 GeV	1.2×10^{31}	

Beam	Momentum range (GeV/c)	$\pm \Delta p/p$ (%)	Production angle ($^\circ$)	Solid angle (msr)	Particles	Maximum particles per pulse	at (GeV/c)	Repetition rate (Hz)	Facility	Comments	
21	1-16	≤ 4.0	1	0.03	K^+/K^-	17/8	10	≤ 180	Test beams	Separated: $\pi/K \approx 1/30$ $\pi/p \approx 1/14$	
					p/\bar{p}	40/6					
	1-8				π^+/π^-	10^3					
					e^-	10^4					
					e^+	10^4	2.5				
27	20	9.0 FWHM	0	10^{-7}	γ	10^2	20	≤ 20	Test beam	Backscattered laser beam	
3	≤ 15	0.1-1.0			e^+	2×10^{10}	All	≤ 90	ESA 1.6, 8, & 20 GeV/c spectrometers	e^+ beam requires high power source; all fluxes at $\Delta p/p = \pm 0.25\%$ See footnote A	
	≤ 23.5	0.1-1.0			e^-	5×10^{11}	All	≤ 360			
	3.237 j (j=1,...,6)	0.1-1.0			e^-	5×10^{11}		120, 180			
	3.237 j (j=1,...,6)	≥ 0.5			e^-	10^9		≤ 360			
	≤ 21.5	Brems.	0		γ	4×10^9 EQ	20	≤ 360			0° bremsstrahlung
	5-15	7-10	0		γ	5×10^7 EQ	All	≤ 360			See footnote C
	≤ 21.5	Brems.	0		γ	2×10^8 EQ		≤ 360		See footnote D	
6	0.1-16	≤ 2.0	1.6-6	0.03	e^-	10		≤ 60	Test beams		
	1-16				π^-	10					
19	1-16	0.25	0		e^+	10	10	≤ 60	Test beam	Very pure; $\sigma_x = 1$ mm	

- A. High intensity source; longitudinal polarization = 0.4 (would require reinstallation).
 B. Low intensity source; longitudinal polarization = 0.85 (would require reinstallation).
 C. Coherent bremsstrahlung, linearly polarized (10^9 EQ without collimation).
 D. Linearly polarized at maximum energy by coherent pair production in graphite.

TRIUMF BEAMS [Source: Status of TRIUMF Plans for Development, G. Dutto, E.W. Blackmore, and M.K. Craddock, TRI-82-PP-37 (October 1982)]

The cyclotron energy range is 180-520 MeV with an energy spread of 0.1% (FWHM). The unpolarized intensity is 150 μA , and the polarized intensity is 300 nA; the polarization is 75-82%. The BL4/BL1A split ratio is $1/10^4$. The phase width is variable from 0.5 to 6 ns. The pulse separation is 43 or 217 ns. There are plans to upgrade various performance levels.

Main beam lines

Beam	Particle	Energy (MeV)	Intensity	Momentum spread FWHM (%)	Polarization (%)	Spot size H×V(cm)
BL1A	p	180-520	120 μA (500 MeV)	0.2	0	0.2×0.5
BL4/1B	\bar{p}	180-520	300nA	0.2	70-80	0.2×0.5
BL4A	\bar{n}	160-500	10 ⁶ /sec	1.0	40-75	6×6
BL2C	p	65-100	10 μA	0.2	0	1×2

Secondary lines The M8, M9, and M20 fluxes are for full momentum acceptance with 100 μA of protons on a 10-cm Be target. The M11, M13, and M15 fluxes are for full momentum acceptance with 100 μA of protons on a 1-cm C target. Beams of π^- and μ^- have the same properties as the π^+ and μ^+ beams, except fluxes are about 5 times lower.

Beam	Particle	Momentum (MeV/c)	Particle flux (per sec)	→ at (MeV/c)	Momentum spread FWHM (%)	Polarization (%)	Spot size H×V(cm)
M8	π^-	0-220	1.3×10 ⁸	180	13	--	1×2
M9	μ^-	30-150	10 ⁶	77	14	50	8×8
	π^+	30-250	2×10 ⁸	120	14	--	10×2
M20	μ^+	30-200	2.5×10 ⁶	30	5	>90	4×3
			2×10 ⁶	85	8	75	8×8
M13	π^+	30-130	5×10 ⁷	130	10	--	3×2
	μ^+	30 (surface)	1.3×10 ⁶	30	10	>90	3×2
M11	π^+	90-470	5×10 ⁶	200	3	--	2×3
M15 (design)	μ^+	30 (surface)	1.6×10 ⁶	30	12	>90	2×1

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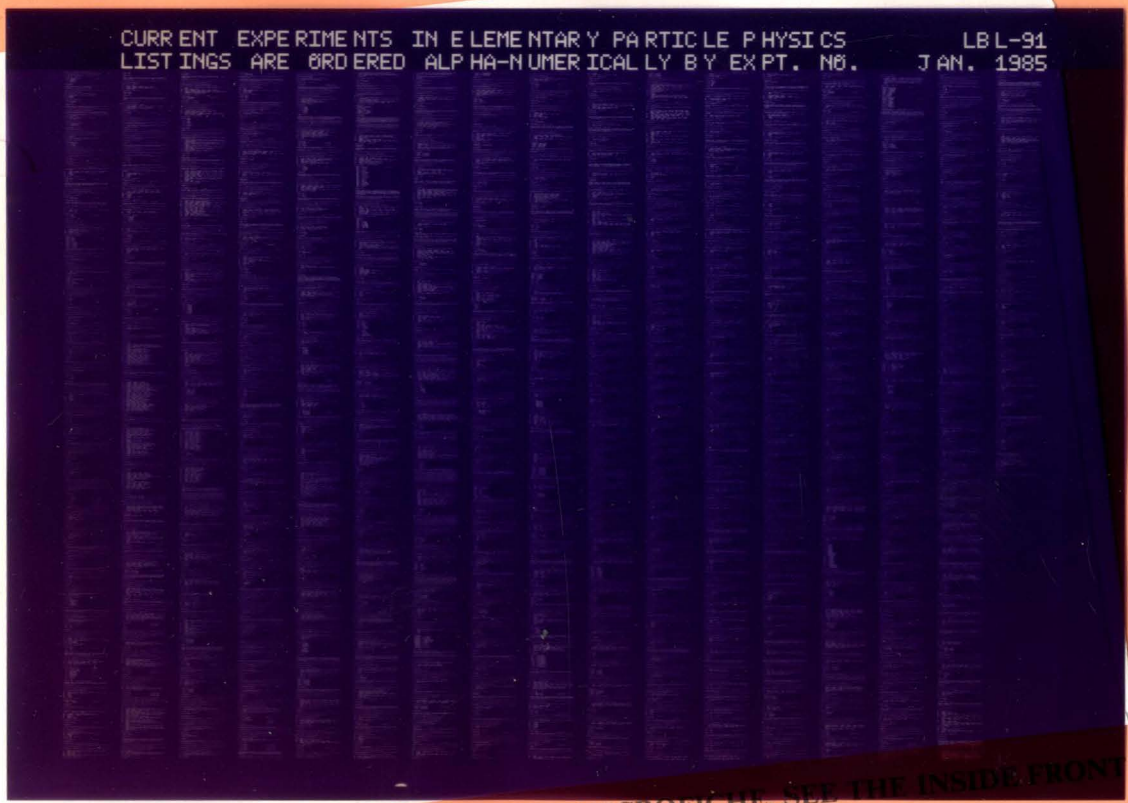
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