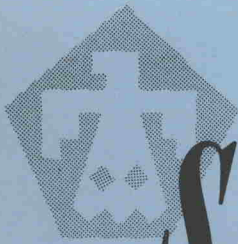


Exploding Wires

H. J. Hall

SCR-53



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EXPLODING-WIRE PHENOMENA

by

WH Richardson

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PREFACE

This survey of the literature on Exploding-Wire Phenomena was initiated by the Physical Research Department to support their research investigations. They collected many of the early references and turned the list over to the compiler for verification and expansion.

The survey covers all forms of references--books, periodicals, reports--through April, 1958. It includes early material on basic physics and properties of materials.

Two items cover a large part of the field. One is W. M. Conn's excellent article and bibliography in Zeitschrift für Angewandte Physik, 1955. The other is William G. Chace's bibliography published by the Cambridge Research Center--GRD-TM-57-5, November, 1956. Since Conn's article is in German and Chace's bibliography covers much material not in Conn, it was decided to include both in the present compilation with other and later additions.

The additional references were selected from Physics Abstracts, Electrical Engineering Abstracts, Chemical Abstracts, U. S. Government Research Reports, and a demand bibliography from ASTIA.

The author hopes that users of the bibliography will call attention to errors or omissions.

INTRODUCTION

The journal abbreviations are those of Physics Abstracts.

The bibliography is arranged alphabetically by author and under each author chronologically by title. Sources are indicated by a number in brackets at the end of the citation. These source numbers refer to the consecutive numbering of the bibliography.

The English translation of foreign language titles is given in parentheses after the original title. The translation number of those references which are on deposit in the Special Libraries Association Translation Center at The John Crerar Library are indicated in parentheses following the title.

EXPLODING-WIRE PHENOMENA

1. Alfvén, H.
COSMICAL ELECTRODYNAMICS
London: Oxford Univ. Press, 1950. pp 86-7. [33]
2. Allen, W. A., et. al.
ELECTRONIC SHUTTER PHOTOGRAPHS OF EXPLODING BRIDGE WIRES
Rev. Sci. Instrum., 24:1068-1069, 1953. [44,58]
3. Allibone, T. E., and Meek, J. M.
THE DEVELOPMENT OF THE SPARK DISCHARGE
Proc. Roy. Soc. A, 166:97-126; 169:246-68, 1938. [44]
4. Allison, S. K., et. al.
THE ABSENCE OF HELIUM FROM GASES LEFT AFTER THE PASSAGE OF ELECTRIC DISCHARGES
J. Amer. Chem. Soc., 46:814-824, 1926. [44]
5. Anderson, J. A.
SPECTRA OF EXPLOSIONS
Proc. Nat. Acad. Sci. (U.S.), 6:42-43, 1920. [44]
6. Anderson, J. A.
THE SPECTRUM OF ELECTRICALLY EXPLODED WIRES
Astrophys. J., 51:37-48, 1920. [44,58]
7. Anderson, J. A.
THE SPECTRAL DISTRIBUTION AND OPACITY OF WIRE EXPLOSION VAPORS
Proc. Nat. Acad. Sci. (U.S.), 8:231-232, 1922. [44]
8. Anderson, J. A., et. al.
GENERAL CHARACTERISTICS OF ELECTRICALLY EXPLODED WIRES
Astrophys. J., 64:295-314, 1926. [44,58,166]
9. Anderson, J. A.
SPECTRAL ENERGY-DISTRIBUTION OF THE HIGH-CURRENT VACUUM TUBE
Astrophys. J., 75:394-406, 1932. [44]
10. Anderson, J. A.
ELECTRICALLY EXPLODED WIRES
In National Research Council, International Critical Tables.
New York: McGraw-Hill, 1934. Vol. 4, p 434. [44]
11. Atalla, M. M.
MECHANISMS OF THE SHORT ARC AND EROSION OF CONTACTS. (ARCING OF ELECTRICAL CONTACTS IN TELEPHONE SWITCHING CIRCUITS. V.)
Bell Sys. Tech. J., 34:1081-1102, Sept. 1955.

12. Avramescu, A.
TRUE SPECIFIC HEATS OF Al AND Cu AT TEMPERATURES UP TO THEIR MELTING POINTS
Z. Tech. Phys., 20:213-217, 1939.
13. Baird, K. M.
SHOCK WAVES IN GLASS
Nature, 160:24-25, 1947. [44,58]
14. Baxter, H. W.
ELECTRIC FUSES
London: Edward Arnold, 1950. 199 pp. [44]
15. Beer, A.
UEBER DIE OBERFLÄCHEN ROTIERENDER FLÜSSIGKEITEN IM ALLGEMEINEN, INSBESONDERE
ÜBER DEN PLATEAU 'SCHEN ROTATIONVERSUCH. (GENERAL STUDY OF THE SURFACES OF
ROTATING FLUIDS, PARTICULARLY REGARDING PLATEAU'S ROTATION EXPERIMENT)
Ann. Phys. (Leipzig), 6 (96):1-18, 210-35, 1855. [58]
16. Beer, A.
UEBER DIE PLATEAU'SCHEN VERSUCHE MIT FLÜSSIGKEITEN, WELCHE DER WIRKUNG DER
SCHWERKRAFT ENTZOGEN SIND. (ABOUT PLATEAU'S EXPERIMENT WITH LIQUIDS WHICH ARE
REMOVED FROM THE FORCE OF GRAVITY)
Ann. Phys. (Leipzig), 6 (100):459-62, 1857. [58]
17. Behrens, W.
TEMPERATUR-BESTIMMUNG BEI ELEKTRISCHEN DRAHT-EXPLOSIONEN. (TEMPERATURE DETER-
MINATION IN ELECTRICAL WIRE EXPLOSION) Dis. Hannover, Abs. in
Physik. Ber., 16:1958, 1935. [44]
18. Bellaschi, P. L.
HEAVY SURGE CURRENTS--GENERATION AND MEASUREMENT
Trans. Am. Inst. Elect. Engrs., 53:86-94, 1934. [44]
19. Bellaschi, P. L.
LIGHTNING CURRENTS IN FIELD AND LABORATORY
Elect. Engng., 54:837-843, 1935. [44]
20. Bellaschi, P. L.
LABORATORY LIGHTNING--THE MICROSECOND SWITCH
Elect. J., 33:273-275, 1936. [44]
21. Bethge, O.
MECHANISCHE VERFORMUNGEN DURCH ELECTRISCHE ENTLADUNGEN. (MECHANICAL DISTOR-
TIONS DUE TO ELECTRICAL DISCHARGES) (57-1415)
Ann. Phys. (Leipzig), 8:475-499, 1931. [44]
22. Binder, L.
KURZSCHLUSSERWÄRMUNG IN KRAFTWERKEN UND UEBERLANDNETZEN. (SHORT-CIRCUIT
HEATING IN POWER PLANTS AND TRANSMISSION LINES)
Elektrotech. Z., 37:589-90, 606-9, 1916. [58]
23. Bitter, H.
EFFECT OF DIMENSIONING OF A CONTROLLED FUSE WIRE ON THE SIZE OF THE EXTINCTION
ENERGY OF HH-FUSES
Siemens-Z., 32:39-43, 1958.
24. Boehne, E. W.
DETERMINATION OF CIRCUIT RECOVERY RATES
Trans. Amer. Inst. Elect. Engrs., 54:530-539, May 1935. [26]

25. Boehne, E. W. and Linde, L. J.
MAGNE-BLAST AIR CIRCUIT BREAKER FOR 5000-VOLT SERVICE
Trans. Am. Inst. Elect. Engrs., 59:202-12, 1940, and Gen. Elect. Rev., 42:401-8, 1939. [26]
26. Boehne, E. W.
THE GEOMETRY OF ARC INTERRUPTION
Gen. Elect. Rev., 44:207-216, 1941.
27. Boehne, E. W.
THE GEOMETRY OF ARC-INTERRUPTION, II CURRENT ZERO PHENOMENA
Trans. Amer. Inst. Elect. Engrs., 63:375-86, 1944.
28. Bond, W. L.
NOTES ON SOLUTION OF PROBLEMS IN ODD JOB VAPOR COATING
J. Opt. Soc. Amer., 44:429-38, 1954. [58]
29. Bondarenko, V. V., et. al.
RESISTANCE OF METALS AT HIGH CURRENT DENSITIES
Zh.eksper. Teor. Phys., 28:191-8, 1955; Soviet Physics JETP, 1:221-6, 1956.
30. Borodovskaya, L. N. and Lebedev, S. V.
DEPENDENCE OF THE ELECTRICAL CONDUCTIVITY AND ELECTRON EMISSION ON THE ENERGY OF A METAL IN THE PROCESS OF ITS HEATING BY A CURRENT OF HIGH DENSITY
Zh.eksper. Teor. Fiz., 28:96-110, 1955; Soviet Physics JETP 1:71-83, 1956. [44]
31. Bostick, Winston H., and Levine, Morton A.
MEASUREMENTS ON THE PINCH EFFECT PERFORMED WITH A SPECTROGRAPH AND PHOTO-MULTIPLIER TUBE
Research Lab. of Physical Electronics, Dept. of Physics, Tufts College, Medford, Mass., Scientific Report No. 6 (PB-112428). June 30, 1953, 21 pp.
32. Bostick, Winston H., and Levine, Morton A.
ELEMENTARY CONSIDERATIONS OF THE PINCH EFFECT IN AN IONIZED GAS AT LOW PRESSURES CARRYING A HIGH CURRENT
Research Lab. of Physical Electronics, Department of Physics, Tufts College, Medford, Mass., Scientific Report No. 9 (PB-113332). August 15, 1953, 10 pp.
33. Bostick, Winston H., and Levine, Morton A.
RELATIONSHIPS INVOLVED IN THE $H_z - E_0$ PINCH EFFECT
Research Lab. of Physical Electronics, Dept. of Physics, Tufts College, Medford, Mass., Scientific Report No. 10 (PB-113333). September 1953, 10 pp.
34. Bostick, Winston H., and Levine, Morton A.
FURTHER MEASUREMENTS ON THE PINCH EFFECT IN NITROGEN AND HELIUM
Research Lab. of Physical Electronics, Department of Physics, Tufts College, Medford, Mass., Scientific Report No. 12 (PB-114744). March 1954, 17 pp.
35. Bostick, Winston H., and Levine, Morton A.
CALCULATION OF THE SPEED NECESSARY IN THE PRODUCTION OF THE PINCH IF THERE IS TO BE NO E-FOLDING OF SCHWARZCHILD-KRUSKAL INSTABILITY IN THE PINCH
Research Lab. of Physical Electronics, Dept. of Physics, Tufts College, Medford, Mass., Scientific Report No. 13 (PB-114765). March 1954, 9 pp.
36. Bowden, F. P., and Yoffe, A. D.
INITIATION AND GROWTH OF EXPLOSION IN LIQUIDS AND SOLIDS
Cambridge, Univ. Press, 1952, 104 pp. [58]
37. Braun, F.
DER HERTZSCHE GITTERVERSUCH IM GEBIET DER SICHTBAREN STRAHLUNG. (HERTZ' LATTICE EXPERIMENT IN THE FIELD OF VISIBLE RADIATIONS)
Ann. Phys. (Leipzig), 16:1-19, 1905. [58]

38. Braun, F.
DER MECHANISMUS DER ELECTRISCHEN ZERSTÄUBUNG; SCHMELZEN VON KOHLENSTOFF;
ZERLEGUNG VON METALLEGIERUNGEN. (THE MECHANISM OF ELECTRICAL SPUTTERING;
FUSION OF CARBON; SEGREGATION OF ALLOYS)
Ann. Phys. (Leipzig), 17:359-363, 1905. [44,58]
39. Breidenbach, H. I., Jr.
A FRACTIONAL MICROSECOND X-RAY PULSE GENERATOR STUDYING HIGH EXPLOSIVE PHENOMENA
Rev. Sci. Instrum., 20:899-903, 1949. [44]
40. Briscoe, H. V. A., et. al.
THE ELECTRICAL EXPLOSION OF TUNGSTEN WIRES
J. Chem. Soc., 127:240-247, 1925. [44]
41. Broniewski, W.
ELECTRIC PROPERTIES OF Al-Ag ALLOYS
C. R. Acad. Sci. (Paris), 150:1754-1757, 1910. [126]
42. Carson, J. R.
WAVE PROPAGATION OVER PARALLEL WIRES: THE PROXIMITY EFFECT
Phil. Mag., 12:607, April 1921. [80]
43. Carson, J. R. and Gilbert, J. J.
TRANSMISSION CHARACTERISTICS OF THE SUBMARINE CABLE
J. Franklin Inst., 192:705, December 1921. [80]
44. Chace, William G.
A BIBLIOGRAPHY OF THE ELECTRICALLY EXPLODED WIRE PHENOMENA
Air Force Cambridge Research Center, (GRD-TM-57-5). November 1956, 64 pp.
45. Chace, W. G.
INSTRUMENTATION FOR STUDIES OF THE EXPLODING WIRE PHENOMENON
Air Force Cambridge Research Center, Instrumentation for Geophysical Research
No. 7 (AFCRC-TR-57-235), August 1957, 35 pp.
46. Chandrasekhar, S.
ON THE INHIBITION OF CONVECTION BY A MAGNETIC FIELD
Phil. Mag., 43:501-532, 1952. [153]
47. Chandrasekhar, S.
THE STABILITY OF VISCOUS FLOW BETWEEN ROTATING CYLINDERS IN THE PRESENCE OF A
MAGNETIC FIELD
Proc. Roy. Soc. A, 216:293-309, 1953. [153]
48. Chiotti, P.
MEASUREMENTS OF THE ELECTRICAL RESISTANCE OF METALS AND ALLOYS AT HIGH
TEMPERATURES
Rev. Sci. Instrum., 25:876-883, 1954. [44]
49. Christie, D. G.
A MULTIPLE SPARK CAMERA FOR DYNAMIC STRESS ANALYSIS
J. Photogr. Sci., 3:153-9, 1955.
50. Cobine, J. D., and Burger, E. E.
ANALYSIS OF ELECTRODE PHENOMENA IN THE HIGH-CURRENT ARC
J. Appl. Phys., 26:895-900, 1955. [44]
51. Conn, W. M.
UEBER DAS AUFTRETEN VON KONTINUIERLICHEN SPEKTREN BEI KATHODENSTRAHL-
BOMBARDMENT, PARTS IV AND VI. (ON THE OCCURRENCE OF CONTINUOUS SPECTRA
DURING CATHODE RAY BOMBARDMENT)
Z. Phys., 72:392-422, 1931; 75:544-554, 1932. [58]

52. Conn, W. M.
NOTE ON THE POLARIZATION OF LIGHT EMITTED BY ELECTRICALLY EXPLODED WIRES
Phys. Rev., 58:50-51, 1940. [2,44,58]
53. Conn, W. M.
EXPLODING WIRES AS A SOURCE OF HIGH TEMPERATURE
In American Institute of Physics, Temperature, Its Measurement and Control in Science and Industry. New York: Reinhold, 1941. p 770. [44]
54. Conn, W. M.
A COATING METHOD BASED ON THE USE OF ELECTRICALLY EXPLODED WIRES (Abstract)
Phys. Rev., 79:213, 1950. [44,58]
55. Conn, W. M.
THE USE OF "EXPLODING WIRES" AS A LIGHT SOURCE OF VERY HIGH INTENSITY AND SHORT DURATION
J. Opt. Soc. Amer., 41:445-449, 1951. [2,44,58]
56. Conn, W. M.
A NEW EFFECT OBSERVED IN CONNECTION WITH ELECTRICALLY "EXPLODED" WIRES
Nature, 169:150-1, 1952. [44,58]
57. Conn, W. M.
METALLIC DEPOSITS AND SHOCK WAVES DUE TO ELECTRICALLY "EXPLODED" WIRES (Abstract)
Phys. Rev., 98:1551, 1955. [44]
58. Conn, W. M.
STUDIEN ZUM MECHANISMUS VON ELEKTRISCHEN DRAHT-EXPLOSIONEN. (METALL NIEDER-SCHLÄGE UND STOSSWELLEN). (STUDIES ON THE MECHANISM OF ELECTRICAL WIRE EXPLOSIONS). (METAL DEPOSITS AND SHOCK WAVES)
Z. Angew. Phys., 7:539-54, 1955.
59. Conn, W. M.
STUDIES OF THE MECHANISM OF ELECTRICALLY EXPLODED WIRES
Naturwissenschaften, 42:65-66, 1955. [44]
60. Conn, W. M.
THE PRODUCTION OF EXTREMELY HIGH TEMPERATURES: COMBINATION OF ELECTRICALLY EXPLODED WIRES AND ELECTRIC ARCS
In U. S. Air Force, Cambridge Research Center, Electronics Research Directorate, Conference on Extremely High Temperatures, Boston, Mass., March 18-19, 1958.
New York: Wiley, 1958. pp 29-44.
61. Constant, F. W., and Formwalt, J. M.
FERROMAGNETIC IMPURITIES (Letter)
Phys. Rev., 53:432, 1938. [258]
62. Courtney-Pratt, J. S. and Huggins, C. M.
ULTRA-HIGH-SPEED FLASH CINEMICROGRAPH
Rev. Sci. Instrum., 28:254-5, April 1957.
63. Courtney-Pratt, J. S. and Huggins, C. M.
CONSTRUCTION AND PERFORMANCE OF A HIGH SPEED CINEMICROGRAPH
Rev. Sci. Instrum., 28:256-62, April 1957.
64. Cox, J. H., et. al.
THE KLYDONOGRAPH AND ITS APPLICATION TO SURGE INVESTIGATIONS
Trans. Am. Inst. Elec. Engrs., 44:857-871, 1925. [44]
65. Craggs, J. D., et. al.
THE DEVELOPMENT OF TRIGGERED SPARK-GAPS FOR HIGH POWER MODULATORS
Proc. Inst. Elec. Engrs., 95:963-76, 1946. [44]

66. Cullington, E. H., et. al.
LOVOTRON-A LOW VOLTAGE TRIGGERED SWITCH GAP
Instrumentation for Geophysical Research, No. 5, (AFCRC-TR-55-227)
Air Force, Cambridge Research Center, September 1955. [44]
67. Curtis, H. L.
HIGH-FREQUENCY RESISTANCE AND INDUCTANCE OF PARALLEL CYLINDRICAL WIRES:
NEW INTEGRATION METHOD FOR COMPUTATION
Scientific Paper, No. 374, Bull. Nat. Bur. Stand., 16:93-124, 1920. [80]
68. Czajka, S.
FUSE WIRE FOR OPEN HIGH-VOLTAGE FUSES
Osterr. Z. Elektwirtschaft., 9:454-9, September 1956.
69. Day, P. B.
THE RADIANT INTENSITY OF ELECTRICALLY EXPLODED WIRES. (Abstract)
J. Opt. Soc. Amer., 43:817, 1953. [44,58]
70. Dean, R. H.
THE LIMITATION OF FAULT CURRENT, POWER AND ENERGY BY CARTRIDGE FUSE LINKS
Elect. Energy, 2:48-51, 1958.
71. Dechene, R.
ETUDE DES SPECTRES DE FILS EXPLOSES. (STUDY OF THE SPECTRA OF EXPLODED WIRES)
J. Phys. Radium, 7:59-64, 1926. [44,58]
72. Delauney, C., and Sturm, M.
SUR LA SURFACE DE REVOLUTION DONT LA COURBURE MOYENNE EST CONSTANTE. (ON THE
SURFACE OF REVOLUTION WHOSE MEAN CURVATURE IS CONSTANT)
J. de Math. Liouville, 6:309-20, 1841. [58]
73. Dieke, G. H.
SHORT-PERIOD PHENOMENA IN LIGHT SOURCES
In American Society for Testing Materials, Symposium on Spectroscopic Light
Sources, (ASTM Tech Pubn No. 76). Philadelphia, 1946. 37 pp. [44]
74. Di Persio, Robert
EXPLODING WIRE AND SPARK GAP CENTRAL INITIATOR FOR HIGH EXPLOSIVES
BRL-Memo-851, Ballistic Research Labs., Aberdeen Proving Ground, Md., (AD-59600)
October 1954. 29 pp.
75. Dubs, Charles W.
THEORY OF MOTION OF A THIN METALLIC CYLINDER CARRYING A HIGH CURRENT
Research Lab. of Physical Electronics, TC-89-SR-16, Tufts Univ., Medford, Mass.
(AD-91987), October 6, 1955. 31 pp.
76. Dwight, H. B.
SKIN EFFECTS OF A RETURN CIRCUIT OF TWO ADJACENT STRAP CONDUCTORS
Elect. J., 13:157, April 1916. [80]
77. Dwight, H. B.
SKIN EFFECT ON TUBULAR AND FLAT CONDUCTORS
Trans. Amer. Inst. Elect. Engrs., 37:1379-1400, 1918. [80]
78. Dwight, H. B.
SKIN EFFECT AND PROXIMITY EFFECT IN TUBULAR CONDUCTORS
J. Amer. Inst. Elect. Engrs., 41:203-9, March 1922. [80]
79. Dwight, H. B.
A PRECISE METHOD OF CALCULATION OF SKIN EFFECT IN ISOLATED TUBES
J. Amer. Inst. Elect. Engrs., 42:827-31, 1923. [80]

80. Dwight, H. B.
PROXIMITY EFFECT IN WIRES AND THIN TUBES
Trans. Amer. Inst. Elect. Engrs., 42:850-859, 1923.
81. Early, H. C. and Martin, E. A.
THE UNDERWATER SPARK; A PHOTOGRAPHIC LIGHT SOURCE OF HIGH INTRINSIC BRILLIANCE
Trans. Amer. Inst. Elect. Engrs. Part I, 74:788-790, 1955; and Engineering Res.
Inst., Univ. of Michigan, Ann Arbor, Mich., (AD-58851), February 1955. 10 pp. [44]
82. Early, H. C., and Walker, R. C.
THE ECONOMICS OF MULTIMILLION WATT-SECOND INDUCTIVE ENERGY STORAGE
Am. Inst. Elec. Eng., Paper 56-333, 1956. [44]
83. Eckstein, L., et. al.
DAS SPEKTRUM EXPLODIERENDER LITHIUMDRÄHTE. (THE EXPLOSION SPECTRUM OF LITHIUM WIRES)
Z. Phys., 64:547-555, 1930. [44,58]
84. Edels, H.
THE DETERMINATION OF THE TEMPERATURES OF AN ELECTRICAL DISCHARGE IN A GAS
The British Electrical and Allied Industries Research Assn. Technical Report Reference L/T 230, 1950. 51 pp. [44]
85. Edgerton, H. E.
A RAPID ACTION SHUTTER WITH NO MOVING PARTS
J. Soc. Motion Picture Televis. Engrs., 56:398-406, 1951. [2]
86. Eiselt, B.
ÜBER DEN ABLAUF VON DRAHTEXPLOSIONEN. (THE COURSE OF WIRE EXPLOSIONS) (ATS-4DF3G)
Z. Phys., 132:54-71, 1952; Physik. Ber., 30:768-9 (Abstract), 1951. [44,58]
87. Ellis, C. E., and Scott, G. D.
THE STRUCTURE OF SPUTTERED SILVER FILMS
J. Appl. Phys., 23:31-4, 1952. [58]
88. Ellwood, W. B.
THE MEASUREMENT OF THE TRANSIENT POWER AND ENERGY DISSIPATED IN CLOSING SWITCH CONTACTS
Bell Syst. Tech. J., 34:1191-223, 1955.
89. Ende, W.
SPARKS PRODUCED BY SHORT-CIRCUITING
Ann. Phys. (Paris), 17:460-2, June 1933. [58]
90. Eschenbach, R. C.
MEASURING VOLTAGE IN AN EXPLODING WIRE DISCHARGE
Army Project 4A, July 1948. [44]
91. Esser, H. and Eusterbrock, H.
UNTERSUCHUNG DER WÄRMEAUSSDEHNUNG VON EINIGEN METALLEN UND LEGIERUNGEN MIT EINEM VERBESSERTEN DILATOMETER. (EXPERIMENTS ON HEAT EXPANSION OF SEVERAL METALS AND ALLOYS WITH AN IMPROVED DILATOMETER)
Arch. f. Eisenhüttenw., 14:341-55, 1941. [58]
92. Fairbairn, A. R., and Gaydon, A. G.
SPECTRA PRODUCED BY SHOCK WAVES, FLAMES AND DETONATIONS
Proc. Roy. Soc. A, 239:464-75, 1957.
93. Faraday, M.
DIVISION BY THE LEYDEN DEFLAGRATION
Proc. Roy. Ins., 8:356, 1857. [44]

94. Fayolle, P., and Naslin, P.
PHOTOGRAPHIE INSTANTANEE ET CINEMATOGRAPHIE ULTRA-RAPIDE. (INSTANTANEOUS PHOTOGRAPHY AND HIGH SPEED CINEMATOGRAPHY)
Paris: Revue d'Optique, 1950. [44]
95. Fetz, H.
UEBER DIE KATHODENZERSTÄUBEN BEI SCHIEFEM AUFPRALL DER IONEN. (CATHODE SPUTTERING UPON OBLIQUE IMPACT OF THE IONS)
Z. Phys., 119:590-601, 1942. [58]
96. Field, A. B.
EDDY CURRENTS IN LARGE SLOT-WOUND CONDUCTORS
Proc. Amer. Inst. Elect. Engrs., p 659, July 1905. [80]
97. Finkelburg, W.
CONTINUOUS ELECTRON RADIATION IN GAS DISCHARGES
Phys. Rev., 45:341-342, 1934. [44]
98. Finkelburg, W.
KONTINUIERLICHE SPEKTREN. (CONTINUOUS SPECTRA)
Berlin: Springer, 1938. [58]
99. Flowers, J. W.
THE CHANNEL OF THE SPARK DISCHARGE
Phys. Rev., 64:225-235, 1943. [44]
100. Foitzik, R., and Siemer, W.
ARTIFICIAL CURRENT SURGES UP TO 300,000 A. (AEC-TR-2428), (721)
V. D. E. - Fachber., 10:35-38, 1938.
101. Foitzik, R.
EXPERIMENTS WITH HEAVY SURGE-CURRENTS
Elektrotech Z., 60:89-92, 1939. Sandia Corp., Albuquerque, N. M. Translation (SCL-T-153).
102. Frenkel, J.
THEORIE DER ABSORPTION UND VERWANDTER ERSCHEINUNGEN. (THEORY OF ABSORPTION AND RELATED PHENOMENA)
Z. Phys., 25:117-39, 1924. [58]
103. Früngel, F.
A NEW HIGH-FREQUENCY SPARK APPARATUS FOR LONG SPARK TRAINS (25,000/SEC), AND THE APPLICATION OF CONTROLLED SINGLE SPARKS IN "VOLTAGE OPTICS"
Z. Angew. Phys., 8:86-90, 1956.
104. Futagami, T.
VELOCITY OF ATOMS AND IONS PROJECTED FROM A WIRE EXPLODED ELECTRICALLY
Bull. Inst. Phys. Chem. Research (Tokyo), 15:711-7, 1936.
105. Futagami, T.
ON THE ELECTRIC EXPLOSION SPECTRUM OF METALS
Sci. Papers Inst. Phys. Chem. Research (Tokyo), 31:No. 671:1-29, 1937. [44,58]
106. Gans, R.
KINETIC THEORY OF THE MOTION OF IONS IN A MAGNETIC FIELD
Ann. Phys. (Leipzig), 20:293, 1906. [258]
107. Gibson, F. C., et. al.
IMAGE CONVERTER CAMERA FOR STUDIES OF EXPLOSIVE PHENOMENA
Rev. Sci. Instrum., 25:173-176, 1954. [44]

108. Gilman, R. E.
EDDY CURRENT LOSSES IN ARMATURE CONDUCTORS
Trans. Amer. Inst. Elect. Engrs., 39:997, 1920. [80]
109. Gobrecht, H.
EIN BEITRAG ZUM VERHALTEN FRISCH AUFGEDAMPFTER METALLSCHICHTEN
(EVAPORATION OF METAL FILMS)
Z. Phys., 183:345-52, 1954. [58]
110. Gordon, G., and Cady, W. M.
ROTATING MIRROR OPTICAL SYSTEM
J. Opt. Soc. Amer., 40:852-853, 1950. [44]
111. Greene, E. F.
CHEMICAL REACTIONS IN STRONG SHOCK WAVES
J. Amer. Chem. Soc., 76:2127-31, 1951. [58]
112. Guderly, G.
STARKE KUGELIGE UND ZYLINDRISCHE VERDICHTUNGS-STÖSSE IN DER NÄHE DES
KUGELMITTELPUNKTES BZW. DER ZYLINDERACHSE. (STRONG SPHERICAL AND CYLINDRICAL
SHOCK WAVES IN THE VICINITY OF THE CENTER OF THE SPHERE OR OF THE CYLINDER AXIS)
Luftfahrtforsch., 19:302-11, 1942. [58]
113. Guile, A. E.
THE CALCULATION OF THE COMPLETE TIME/CURRENT CHARACTERISTIC OF CARTRIDGE FUSES
WITH SINGLE WIRE ELEMENT
Trans. Amer. Inst. Elect. Engrs. III, 74:1108-15, 1955.
114. Guile, A. E.
THE CALCULATION OF COMPLETE TIME/CURRENT CHARACTERISTICS OF CERTAIN CARTRIDGE
FUSES WITH STRIP ELEMENTS
Elect. Energy, 1:114-19, 1956.
115. Hackspill, L.
ELECTRIC RESISTANCE OF ALKALINE METALS
C. R. Acad. Sci., (Paris), 151:305-308, 1910. [126]
116. Harrington, E. J., and Romberg, H. C.
HIGH-SPEED MOTION-PICTURE PHOTOGRAPHY OF ELECTRICAL ARCS ON A HIGH-VOLTAGE
POWER SYSTEM
J. Soc. Motion Picture Televis. Engrs., 60:675-9, 1953.
117. Hauver, G. E.
A SPECTROGRAPH WITH SPACE-TIME RESOLUTION AND ITS APPLICATION TO THE STUDY
OF EXPLODING TUNGSTEN WIRES
Ballistics Research Lab., Aberdeen, Md., BRL-Memo-913, (AD-77722),
July 1955. 16 pp. [44]
118. Heine-Geldern, R. V., et. al.
KERR CELL PHOTOGRAPHY OF HIGH SPEED PHENOMENA
J. Appl. Phys., 22:487-93, April 1951. [2,44,58]
119. Heine-Geldern, R. V.
PHOTOGRAPHIE ULTRA-RAPIDE AU MOYEN DE CELLULES DE KERR ET DE FILS EXPLOSIFS.
(HIGH-SPEED PHOTOGRAPHY BY MEANS OF KERR CELLS AND EXPLODING WIRES)
In International Congress on High-Speed Photography (Second), Proceedings.
Paris: Dunod, 1956. pp 238-43.
120. Herrmann, K. H., and Schaaffs, W.
EIN EFFEKT BEI DER STOSSWEISEN VERDAMPFUNG DER WOLFRAMANODE EINER
RÖNTGENBLITZRÖHRE. (AN EFFECT DURING THE SPASMODIC VAPORIZATION OF THE
TUNGSTEN ANODE OF AN X-RAY FLASH TUBE)
Z. Angew. Physik., 6:154-6, 1954. [58]

121. Herzfeld, C. M.
A STUDY OF BASIC LIMITATIONS TO THE CONCEPT AND MEASUREMENT OF TEMPERATURE:
INCOMPLETE EQUILIBRIUM
National Bureau of Standards, Washington, D.C., (NBS-4420), January 1956. [44]
122. Heywang, W., and Ziegler, G.
ZUR STABILITÄTSENKRECHTER SCHMELZ-ZONEN. (THE STABILITY OF VERTICAL
MOLTEN ZONES), (1243)
Z. Naturforsch., 10:No. 9A, 561-2, 1954. [58]
123. Hollyer, R. N., et. al.
LUMINOSITY GENERATED BY SHOCK WAVES
Nature, 171:395-6, 1953. [58]
124. Holtzworth, R. E., and Hinz, D. J.
EXPLODING WIRE BACKLIGHTING FOR THE STUDY OF DETONATION, SHOCK AND SHAPED
CHARGES
Ballistic Research Lab., Aberdeen Proving Grounds, Md., (BRL-818), May 1952. [44]
125. Honda, K.
MAGNETIC TRANSFORMATION OF AMENTITE. THERMOMAGNETIC PROPERTIES OF VARIOUS
COMPOUNDS AND THE WEISS THEORY OF MAGNETRONS
Sci. Rep. Tohoku Univ., 4:161-167; 261-269; 215-260, 1915. [126]
126. Honda, K.
LATENT HEAT OF FUSION AS THE ENERGY OF MOLECULAR ROTATIONS
Sci. Rep. Tohoku Univ., 7:123-130, 1918.
127. Hori, T.
ON THE ABSORPTION SPECTRA PRODUCED BY THE EXPLOSION OF VARIOUS ELEMENTS
Sci. Papers Inst. Phys. Chem. Research (Tokyo), 4:59-78, 1926. [44,58]
128. Hubel, A. V., and Obermayer, A. V.
UEBER EINIGE ELEKTRISCHE ENTLADUNGERSCHINUNGEN UND IHRE PHOTOGRAPHISCHE
FIXIERUNG. (ABOUT SOME ELECTRICAL GAS DISCHARGE PHENOMENA AND THEIR
PHOTOGRAPHIC RECORDING)
Sitzungsberichte K. Akad. Wiss. Wien, Abt IIA, 98:419-30, 1889. [58]
129. Ignatyeva, L. A., and Kalashnikov, S. G.
ELECTRIC RESISTANCE OF METALS TO PULSES OF HIGH CURRENT DENSITY
Zh. Eksper. Teor. Fiz., 22:385-399, 1952. [44]
130. Israel, H. and Fries, G.
AN APPARATUS FOR THE SPECTROSCOPIC OBSERVATION OF VARIOUS STAGES OF SPARK
DISCHARGES
Optik, 13:365-8, 1956.
131. Jacobs, P. C., Jr.
CURRENT-LIMITING FUSES; THEIR CHARACTERISTICS AND APPLICATION
Trans. Amer. Inst. Elect. Engrs. III, 75:988-93, 1956.
132. Johnson, R. G., and Jones, D. E.
DECAY OF LIGHT TO VERY LOW LEVELS FROM SPARK DISCHARGES
Nature, 170:669-70, 1952. [58]
133. Judkins, R. O.
INVESTIGATION OF A HIGH CURRENT SWITCH TUBE
Sandia Corp., Albuquerque, N. M., (SCTM-157-55-51), 1955. [44]
134. Kapitza, P.
A METHOD OF PRODUCING STRONG MAGNETIC FIELDS
Proc. Roy. Soc., 105:691-710, 1924. [44]

135. Kapitza, P.
FURTHER DEVELOPMENTS OF THE METHOD OF OBTAINING STRONG MAGNETIC FIELDS
Proc. Roy. Soc. A, 115:658-683, 1927. [44]
136. Kaplan, V. V., and Nashatyr, V. M.
TESTING CURRENT-LIMITING H.V. FUSES IN AN OSCILLATORY CIRCUIT
Elektrichestvo, 5:38-42, 1956.
137. U. S. Bureau of Mines
HIGH TEMPERATURE SPECIFIC HEAT EQUATIONS FOR INORGANIC SUBSTANCES by K. K. Kelley
(Contributions to data on theoretical metallurgy II.) (Bulletin No. 371)
Washington: U. S. Govt. Print. Off., 1934. 78 pp.
138. U. S. Bureau of Mines
FREE ENERGIES OF VAPORIZATION AND VAPOR PRESSURE OF INORGANIC SUBSTANCES by
K. K. Kelley
(Contributions to data on theoretical metallurgy III.) (Bulletin No. 383)
Washington: U. S. Govt. Print. Off., 1935. 132 pp. [58]
139. U. S. Bureau of Mines
HEATS OF FUSION OF INORGANIC SUBSTANCES by K. K. Kelley
(Contributions to data on theoretical metallurgy V.) (Bulletin No. 393)
Washington: U. S. Govt. Print. Off., 1936. 166 pp.
140. U. S. Bureau of Mines
HIGH-TEMPERATURE HEAT CONTENT, HEAT CAPACITY AND ENTROPY DATA FOR INORGANIC
COMPOUNDS by K. K. Kelley
(Contributions to data on theoretical metallurgy X.) (Bulletin No. 476)
Washington: U. S. Govt. Print. Off., 1949. 241 pp.
141. U. S. Bureau of Mines
ENTROPIES OF INORGANIC SUBSTANCES. REVISION OF DATA AND METHODS OF
CALCULATION by K. K. Kelley
(Contributions to data on theoretical metallurgy XI.) (Bulletin No. 477)
Washington: U. S. Govt. Print. Off., 1950. 147 pp.
142. Kennelly, A. E., Laws, F. A., and Pierce, P. H.
EXPERIMENTAL RESEARCHES ON SKIN EFFECT ON CONDUCTORS
Trans. Amer. Inst. Elect. Engrs., 34:1953, 1915. [80]
143. Kennelly, A. E., and Affel, H. A.
SKIN EFFECT RESISTANCE MEASUREMENTS
Proc. Inst. Radio Engrs., 4:523-575, 1916. [80]
144. Kesselring, F.
THE PROBLEM OF H.V. SWITCHING
Arch. Elektrotech., 35:155-184, 1941.
145. Keys, R. T.
SOME FRAMING CAMERA STUDIES OF PHENOMENA ASSOCIATED WITH THE DETONATION OF
HIGH EXPLOSIVES
Institute for the Study of Rate Processes, Univ. of Utah, Salt Lake City
Technical Report No. 49 (AD-113205), May 7, 1956.
146. King, A. S.
SPECTROSCOPIC PHENOMENA OF THE HIGH CURRENT ARC
Astrophys J., 62:238-264, 1925. [44]
147. Klarfeld, B.
DIAMAGNETIC SUSCEPTIBILITY OF A PLASMA
Zh. Tekh. Fiz., 5:913, 1938. [258]

148. Kleen, W.
 UBER DEN DURCHGANG DER ELEKTRIZITÄT DURCH METALLISCHE HAARDRÄHTE. (ON THE
 PASSAGE OF ELECTRICITY THROUGH FINE METAL WIRES) (57-2401)
Ann. Phys. (Leipzig), 11:579-605, 1931; Am. Meteor. Soc. Translation (AD-135102)
 March 1957. [44,58]
149. Knauss, H. P., and Bryan, A. L.
 SPECTRAL CHARACTERISTICS OF ELECTRICALLY EXPLODED MERCURY
Phys. Rev., 47:842-844, 1935. [44]
150. Kopal, Z.
 THE PROPAGATION OF SHOCK WAVES IN SELF-GRAVITATING GAS SPHERES
Astrophys. J., 120:159-71, 1954. [58]
151. Kramer, J.
 OBERFLÄCHENUNTERSUCHUNGEN AN METALLEN UND NICHTMETALLEN MIT EXO UND
 PHOTOELEKTRONEN. (SURFACE INVESTIGATION ON METALS AND NON-METALS WITH
 EXO- AND PHOTO-ELECTRON)
Z. Phys., 133:629-46, 1952. [58]
152. Kramer, J.
 VERGLEICH ZWISCHEN LUMINESZENZ UND EXOELEKTRONENEMISSION. (COMPARISONS
 BETWEEN LUMINESCENCE AND EXO-ELECTRON EMISSION)
Naturwissenschaften, 41:160-1, 1954. [58]
153. Kruskal, Martin and Schwarzschild, Martin
 SOME INSTABILITIES OF A COMPLETELY IONIZED PLASMA
Proc. Roy. Soc. A, 223:348-60, 1954.
154. Kvartskhava, I. F., et. al.
 ELECTRICAL EXPLOSION OF METAL WIRES
Zh. Eksper. Teor. Fiz., 30:42-53, 1956; Soviet Physics JETP, 3:40-51, 1957.
155. Kvartskhava, I. F., et. al.
 ELECTRICAL EXPLOSION OF WIRES IN VACUUM
Zh. Eksper. Teor. Fiz., 31:737-44, 1956; Soviet Physics JETP, 4:637-44, 1957.
156. Kvartskhava, I. F., et. al.
 OSCILLOGRAPHIC DETERMINATION OF THE ENERGY OF ELECTRIC EXPLOSION OF WIRES
Zh. Eksper. Teor. Fiz., 31:745-51, 1956; Soviet Physics JETP, 4:623-629, 1957.
157. Lamb, H.
 HYDRODYNAMICS, Sixth Edition
 Cambridge Univ. Press, 1932. 738 pp. [153]
158. Läpple, H.
 ELECTRIC FUSES, A CRITICAL REVIEW OF PUBLISHED INFORMATION
 London: Butterworth, 1952. 173 pp. [44]
159. Lawrence, E. O., and Dunnington, F. G.
 ON THE EARLY STAGES OF ELECTRIC SPARKS
Phys. Rev., 35:396-407, 1930. [44]
160. Lebedev, S. V., and Khaikin, S. E.
 SOME ANOMALIES IN THE BEHAVIOR OF METALS HEATED BY CURRENT PULSES OF GREAT
 DENSITY
Zh. Eksper. Teor. Fiz., 26:629-39, 1954. [58]
161. Lebedev, S. V.
 PHENOMENA IN TUNGSTEN WIRES PRECEDING THEIR DISINTEGRATION UNDER THE EFFECTS
 OF HEAVY CURRENT (R-939)
Zh. Eksper. Teor. Fiz., 27:605-614, 1954. [44]

162. Lebedev, S. V.
EXPLOSIONS OF METALS UNDER THE ACTION OF AN ELECTRIC CURRENT (ATS-12J16R)
Zh. Eksper. Teor. Fiz., 32:199-206, 1957; Soviet Physics JETP, 5:243-52, 1957.
163. Lebedev, S. V., and Milovidova, R. A.
INVESTIGATION OF TIME VARIATION OF EMISSION SPECTRUM OF AN ALTERNATING CURRENT ARC
Optika i Spektrosk., 2:150-9, 1957.
164. Lerstrup, K.
THE MELTING CURVES OF FUSES
Ingeniøren, 65:650-1, 1956.
165. Lewis, M. R., and Sleator, D. B.
EXPLODING WIRE LIGHT SOURCE FOR HIGH SPEED INTERFEROMETRY
Ballistic Research Labs., Aberdeen Proving Ground, Md., BRL-Memo-975
(AD-91596), February 1956. 37 pp.
166. Liddiard, R. P., and Drosd, R. D.
EXPLODING WIRES FOR LIGHT SOURCES IN FAST PHOTOGRAPHY
Naval Ordnance Lab., Silver Spring, Md., (NOLM-10840), 1950. 10 pp. [44]
167. Lin, S.
CYLINDRICAL SHOCK WAVES PRODUCED BY INSTANTANEOUS ENERGY RELEASE
J. Appl. Phys., 25:54-57, 1954. [44,58]
168. Llewellyn-Jones, F.
THE PHYSICS OF ELECTRICAL CONTACTS
Oxford: Clarendon Press, 1957. 219 pp.
169. Lochte-Holtgreven, W.
ÜBER DIE ELEMENTARVORGÄNGE BEI DER ELEKTRISCHEN EXPLOSION DÜNNER METALLDRÄHTE
(TAGUNG ÜBER VERBRENNUNG, STOSSWELLEN, DETONATION, ST. LOUIS)
(CONCERNING THE ELEMENTARY PROCESSES DURING THE ELECTRICAL EXPLOSION OF THIN METAL WIRES. (CONFERENCE ON COMBUSTION, SHOCK WAVES, DETONATION, ST. LOUIS)
Lab. Res. Tech. St. Louis Mem., 325-37, 1951. [58]
170. Lucchi, I.
THE CONSTANT OF THERMAL INERTIA OF FUSES
Elettrotecnica, 36:142-147, 1949.
171. Lundquist, S.
ON THE STABILITY OF MAGNETO-HYDROSTATIC FIELDS
Phys. Rev., 83:307-11, 1951. [153]
172. Lyon, W. V.
HEAT LOSSES IN STRANDED ARMATURE CONDUCTORS
Amer. Inst. Elect. Engrs., 41:37-49, 1922. [80]
173. Manneback, Chas.
AN INTEGRAL EQUATION FOR SKIN EFFECT IN PARALLEL CONDUCTORS
J. Math. Phys., Vol. 2, April 1922. [80]
174. Martin, E. A.
THE UNDERWATER SPARK; AN EXAMPLE OF GASEOUS CONDUCTION AT ABOUT 10,000 ATMOSPHERES
Univ. of Michigan Eng. Res. Inst., Ann Arbor, (UMM-2048-12-F), July 1956. 197 pp.

175. Maxwell, J. Clerk
ELECTRICITY AND MAGNETISM
London: Oxford Univ. Press., 1873. Vol. 2, Par. 689. [80]
176. Mayr, O.
HEAVY DUTY BREAKERS WITHOUT OIL
Elektrotech. Z., 55:757-60, 791-4, 837-40, 1934.
177. Meek, J. M., and Craggs, J. D.
ELECTRICAL BREAKDOWN OF GASES
Oxford: Clarendon Press, 1953. 507 pp. [58]
178. Melton, B. S.
A WORKING MANUAL FOR SPARK SHADOWGRAPH PHOTOGRAPHY
John Hopkins Univ., Applied Physics Lab., Baltimore, Md., (NP-972)
December 1948. 47 pp.
179. Menzies, A. C.
SHIFTS AND REVERSALS IN FUSE-SPECTRA
Proc. Roy. Soc. A, 117:88-100, 1927. [44,58]
180. Michel-Levy, A., and Muraour, H.
EXPERIENCES DE MICROPYROTECHNIE. (EXPERIMENTS IN MICRO-PYROTECHNICS)
C. R. Acad. Sci. (Paris), 198:1499-1501, 2091-92, 1934. [58]
181. Miller, S. W., and Shoens, C. J.
SUB-MICROSECOND X-RAY UNIT FOR EXPLOSIVES RESEARCH
Poulter Labs., Stanford Research Inst., Menlo Park, Calif., Tech. Report 002-55
June 14, 1955. [44]
182. Milne, Gordon G.
ON PROBLEMS OF ILLUMINATION FOR MOTION PICTURE PHOTOGRAPHY AT ULTRA-HIGH SPEEDS
Institute of Optics, Univ. of Rochester, N. Y., (AD-26510), December 30, 1953.
13 pp.
183. Milne, Gordon G.
OPTICAL METHODS FOR HIGH SPEED PHOTOGRAPHY
Institute of Optics, Univ. of Rochester, N. Y., Quarterly Status Report No. 8
(AD-46171), June 15, 1954. 3 pp.
184. Mote, G. E.
CALCULATION OF THE MINIMUM FUSING CURRENT OF FUSES
Voprosy Energetiki, 5:101-8, 1956.
185. Murphy, B.
ELECTRICAL AND OPTICAL CHARACTERISTICS OF D.C. CORONA DISCHARGES IN AIR AT ATMOSPHERIC PRESSURE
Brit. Elect. Res. Assoc., L/T 329, 30 pp., 1956.
186. Nagaoka, H., et. al.
SPECTRA OF METALS EXCITED BY MEANS OF HIGH TENSION AND HEAVY CURRENT
Proc. Imp. Acad. (Japan), 2:161-2, 1926. [44]
187. Nagaoka, H., et. al.
EXPLOSION SPECTRA OF MERCURY
Proc. Imp. Acad. (Japan), 2:254-257, 1926. [44,58,166]
188. Nagaoka, H., et. al.
ELECTRIC EXPLOSION OF WIRES AND THREADS
Proc. Imp. Acad. (Japan), 2:328-329, 1926. [44]

189. Nagaoka, H., and Futagami, T.
INSTANTANEOUS PHOTOGRAPHS OF ELECTRICALLY EXPLODED WIRES
Proc. Imp. Acad. (Japan), 2:387-388, 1926. [44,166]
190. Nagaoka, H., et. al.
INSTANTANEOUS SPECTROGRAMS (VARIOUS METALS)
Proc. Imp. Acad. (Japan), 3:208-212, 258-264, 319-333, 392-418, 499-502, 1927. [44]
191. Nagaoka, H., and Futagami, T.
CINEMATOGRAPHIC SKETCH OF ELECTRICALLY EXPLODED WIRES
Proc. Imp. Acad. (Japan), 4:198-199, 1928. [44,166]
192. Nagaoka, H., and Futagami, T.
ELECTRIC EXPLOSION IN MAGNETIC FIELD
Proc. Imp. Acad. (Japan), 4:283-4, 1928. [44,58]
193. Nagaoka, H., and Futagami, T.
ELECTRIC EXPLOSIONS
Sci. Papers Ins. Phys. and Chem. Res. (Tokyo), 8:269-288, 1928. [2,44,58,166]
194. Nipher, F. E.
MATTER IN ITS ELECTRICALLY EXPLOSIVE STATE
Proc. Am. Phil. Soc., 52:283-286, 1913. [44,58]
195. Norinder, R. H., et. al.
EXPERIMENTAL INVESTIGATIONS OF RESISTANCE AND POWER WITHIN ARTIFICIAL
LIGHTNING CURRENT PATHS
Ark. Mat. Astron. Fys., 36A:1-48, 1949. [44]
196. Northrup, E. F.
ELECTRICAL CONDUCTION AT HIGH TEMPERATURE
J. Electrochem. Soc., 25:373-390, 1914. [126]
197. Northrup, E. F.
RESISTIVITY OF MOLTEN SILVER
J. Franklin Inst., 177:85-7, 1914. [126]
198. Northrup, E. F.
RESISTIVITY OF MOLTEN GOLD
J. Franklin Inst., 177:287-92, 1914. [126]
199. Oster, Gisela K., and Marcus, R. A.
EXPLODING WIRE AS A LIGHT SOURCE IN FLASH PHOTOLYSIS
J. Chem. Phys., 27:187-92, 1957, also Polytechnic Inst. of Brooklyn,
Tech. Report No. 6, (AD-124448), March 15, 1957. 13 pp.
200. Park, J. H.
DESIGN DATA FOR COAXIAL SHUNT AND COAXIAL INDUCTOR
J. Res. Nat. Bur. Stand., 39:191-212, 1947. [44]
201. Park, J. H., and Cones, H. N.
PUNCTURE TESTS ON PORCELAIN DISTRIBUTION INSULATORS USING STEEP-FRONT
VOLTAGE SURGES
Trans. Am. Inst. Elec. Engrs. III, 72:737-41, 1953. [44]
202. Park, R. H., and Skeats, W. F.
CIRCUIT BREAKER RECOVERY VOLTAGES
Trans. Amer. Inst. Elect. Engrs., 50:204-39, 1931. [26]

203. Paszek, J. J., et. al.
LOW VOLTAGE FLASH RADIOGRAPHY
Ballistic Research Lab., Aberdeen Proving Grounds, Maryland, BRL-Memo-645,
February 1953. [44]
204. Paterson, J. E., et. al.
INVESTIGATIONS OF THE USE OF AN EXPLODING WIRE AS A SPECTROGRAPHIC SOURCE
Research Report, Jones and Laughlin Steel Corp., Pittsburg, Pa., Project 633,
T-4, January 1956. [44]
205. Perry, R. W., and Kantrowitz, A.
THE PRODUCTION AND STABILITY OF CONVERGING SHOCK WAVES
J. Appl. Phys., 22:878-86, 1951. [58]
206. Peters, J. F.
THE KLYDONOGRAPH
Elect. Wld., 83:769-773, 1924. [44]
207. Peters, T.
PLASMASTRAHL MIT UEBERSCHALLGESCHWINDIGKEIT. (PLASMA RAY WITH SUPERSONIC
VELOCITY)
Naturwissenschaften., 41:571-2, 1954. [58]
208. Pidduck, F. B.
THE KINETIC THEORY OF THE MOTION OF IONS IN GASES
Proc. London Math. Soc., 15:89, 1915; Phys. Rev. (Letter), 53:197, 1938. [258]
209. Plateau, J.
SUR LES PHENOMENES QUE PRESENTE UNE MASSE LIQUIDE LIBRE ET SOUSTRAITE A L'ACTION
DE LA PESANTEUR. (THE PHENOMENA WHICH ARE PRESENT WHEN LIQUIDS ARE REMOVED
FROM THE FORCE OF GRAVITY)
Mem. l'Acad. Royale Bruxelles, 16,1843; 23,1850; 30,1857; 31,1859.
Smithsonian Inst. Rep., 1864:207-85; 1865:285-369. [58]
210. Porter, H. L.
THE ELECTRIC FUSION OF FINE WIRES
Armament Research Establishment, Fort Halstead, Kent, England, (ARDE-1/53),
1953. [44]
211. Powell, A. H., and Shuck, C. L.
RIBBON ELEMENTS FOR HIGH-VOLTAGE CURRENT-LIMITING FUSES
Trans. Amer. Inst. Elect. Engrs. III, 74:635-43, August 1955.
212. Powell, R. W.
THERMAL CONDUCTIVITIES OF MOLTEN METALS AND ALLOYS
J. Iron Steel Inst., 162:315-324, 1949. [44]
213. Pratt, F. R.
EXPERIMENTAL TEST OF THE WIEDEMANN-FRANZ RATIO THROUGH A CHANGE OF STATE
J. Franklin Inst., 184:675-688, 1917. [126]
214. Prince, D. C., and Skeats, W. F.
THE OIL-BLAST CIRCUIT BREAKER
Trans. Amer. Inst. Elect. Engrs., 50:506, June 1931. [26]
215. Pugh, E. M., et. al.
KERR CELL PHOTOGRAPHY OF HIGH SPEED PHENOMENA
J. Appl. Phys., 22:487-493, 1951. [44]

216. Ramsauer, C.
UEBER EINE NEUE METHODE ZUR ERZEUGUNG HÖCHSTER DRUCKE UND TEMPERATUREN.
(A NEW METHOD FOR THE PRODUCTION OF EXTREME PRESSURES AND TEMPERATURES)
Phys. Z., 34:890-894, 1933.
217. Resler, E. L., et. al.
THE PRODUCTION OF HIGH TEMPERATURE GASES IN SHOCK TUBES
J. Appl. Phys., 23:1390-9, 1952. [58]
218. Riddlestone, J.
SHORT DURATION DISCHARGES BETWEEN SEPARATING CONTACTS IN A 6-VOLT CIRCUIT
Brit. J. Appl. Phys., 8:105-8, 1957.
219. Romier, R.
CIRCUIT BREAKING WITH CURRENT-LIMITING FUSES (ASLIB-GB85)
Rev. Gen. Elect., 65:209-27, April 1956.
220. Rosa, E. B., and Grover, F. W.
FORMULAS AND TABLES FOR THE CALCULATION OF MUTUAL AND SELF-INDUCTANCE,
THIRD EDITION
Scientific Paper No. 169, Bull. Nat. Bur. Stand., 8:226, 1912. [80]
221. Rudenberg, R.
TRANSIENT PERFORMANCE OF ELECTRIC POWER SYSTEMS
New York: McGraw-Hill, 1950. 832 pp. [58]
222. Rutherford, E.
DISINTEGRATION OF ELEMENTS
Nature, 109:418, 1922. [44]
223. Saha, M. N.
ON THE PROBLEM OF TEMPERATURE RADIATION OF GASES
Phil. Mag., 41:267-278, 1921. [44]
224. Saint-Germain, J.
FUSES AND ULTRA-RAPID CIRCUIT BREAKERS FOR AC AND DC OF LOW VOLTAGE
Rev. Gen. Elect., 46:381-90, 1939.
225. Sawyer, R. A., et. al.
THE PRODUCTION OF ENHANCED LINE SPECTRA BY A NEW METHOD
Science, 54:305-306, 1921. [44]
226. Sawyer, R. A., et. al.
THE EXPLOSION SPECTRA OF THE ALKALINE EARTH METALS
Astrophys. J., 57:98-113, 1923. [44,58]
227. Saxe, R. A., and Chippendale, R. F.
MILLIMICROSECOND EXPOSURES BY IMAGE TUBES
Brit. J. of Appl. Phys., 6:336-8, 1955.
228. Schaaffs, W., and Hermann, K. H.
UEBER BRÜCKENBILDUNG IM LICHTBOGEN EINES HOCHSTROMKONTAKTES. (BRIDGE
FORMATION ON ARCING OF A HEAVY CURRENT CONTACT) (57-1799)
Z. Angew. Phys., 6:416-7, 1954. [58]
229. Schall, R., and Thomer, G.
RÖNTGENBLITZ-AUFNAHMEN VON STOSSWELLEN IN FESTEN, FLÜSSIGEN UND GASFÖRMIGEN
MEDIEN. (X-RAY FLASH PHOTOGRAPHS OF SHOCK WAVES IN SOLID, LIQUID AND GASEOUS
MEDIA)
Z. Angew. Phys., 3:41-4, 1951. [44,58]

230. Schardin, H., and Funfer, E.
GRUNDLAGEN DER FUNKENKINEMATOGRAPHIE. (PHYSICAL BASIS OF SPARK CINEMATOGRAPHY)
Z. Angew. Phys., 4:185-199, 224-238, 1952. [44]
231. Schardin, H.
MEASUREMENT OF SPHERICAL SHOCK WAVES
Commun. Pure Appl. Math. (NYU), 7:223-43, 1954.
232. Scheel, K.
UEBER DIE WÄRMEAUSDEHNUNG EINIGER STOFFE. (ON THE HEAT EXPANSION OF SOME MATERIALS)
Z. Phys., 5:167-72, 1921. [58]
233. Schottky, W.
WALL-CURRENTS; THEORY OF POSITIVE COLUMNS
Phys. Z., 25:342-48, 1924. [258]
234. Schottky, W.
THEORY OF POSITIVE COLUMNS
Z. Phys., 31:163, 1925. [258]
235. Sennett, R. S., and Scott, G. D.
THE STRUCTURE OF EVAPORATED METAL FILMS AND THEIR OPTICAL PROPERTIES
J. Opt. Soc. Amer., 40:204-11, 1950. [58]
236. Shabanskii, V. P.
ON DEVIATION FROM OHM'S LAW IN METALS
Zh. Eksper. Teor. Fiz., 27:147-155, 1954. [44]
237. Singer, G. J., and Crosse, A.
AN ACCOUNT OF SOME ELECTRICAL EXPERIMENTS BY M. DENELIS, OF MALINES IN THE NETHERLANDS, WITH AN EXTENSION OF THEM
Phil. Mag., 46:161-166, 259-264, 1815. [2,44,58]
238. Slack, C. M., and Dickson, D. C.
ONE-MILLIONTH-SECOND RADIOGRAPH AND ITS APPLICATIONS
Proc. Inst. Radio Engrs., 35:600-606, 1947. [44]
239. Slepian, J.
DISCUSSION ON DWIGHT: SKIN EFFECT
Trans. Amer. Inst. Elect. Engrs., 37:1401-3, 1918. [80]
240. Smith, H. L., and Early, H. C.
EXPERIMENTAL STUDIES OF UNDERWATER SPARKS
Tech. Report Office of Ord. Research, Ord. Corps, U. S. Army, Project 2048, July 1953. [44]
241. Smith, S.
NOTE ON ELECTRICALLY EXPLODED WIRES IN HIGH VACUUM
Proc. Nat. Acad. Sci. U. S., 10:4-5, 1924. [44,58,166]
242. Smith, S.
A STUDY OF ELECTRICALLY EXPLODED WIRES, ROTATING MIRROR SPECTROGRAPH
Astrophys. J., 61:186-203, 1925. [44,58]
243. Sobolev, N. N.
INVESTIGATION OF THE ELECTRICAL FUSION OF THIN WIRES
Zh. Eksper. Teor. Fiz., 17:986-997, 1947. [44]

244. Sponer, H.
UBER SPEKTREN ELEKTRISCH ZERSTÄUBTER DRÄHTE. (THE SPECTRA OF ELECTRICALLY
DISPERSED WIRES) (57-1417)
Naturwissenschaften, 2:619-620, 1924. [44,58]
245. Sporn, Philip, and Prince, D. C.
ULTRAHIGH-SPEED RECLOSING OF HIGH-VOLTAGE TRANSMISSION LINES
Trans. Amer. Inst. Elect. Engrs., 56:81-100, 1937. [26]
246. Spurck, R. M., and Strang, H. E.
A NEW MULTIBREAK INTERRUPTER FOR FAST-CLEARING OIL CIRCUIT BREAKERS
Trans. Amer. Inst. Elect. Engrs., 57:705-12, 1938. [26]
247. Steenbeck, M.
MAGNETIC PROPERTIES OF GAS DISCHARGE PLASMA
Wiss. Veröff. a.d. Siemens-Werken, 15:1-17, 1936. [258]
248. Strang, H. E., and Boisseau, A. C.
DESIGN AND CONSTRUCTION OF HIGH-CAPACITY AIR-BLAST CIRCUIT BREAKERS
Trans. Amer. Inst. Elect. Engrs., 59:522-7, 1940. [26]
249. Sultanoff, Morton
PHOTOGRAPHIC INSTRUMENTATION IN THE STUDY OF EXPLOSIVE REACTIONS
J. Soc. Motion Picture Televis. Engrs., 60:145-65, 1953.
250. Sultanoff, M.
AN 0.1 MICROSECOND KERR-CELL SHUTTER
Phot. Eng., 5:80-90, 1954. [44]
251. Taylor, G.
THE FORMATION OF A BLAST WAVE BY A VERY INTENSE EXPLOSION
Proc. Roy. Soc. A, 201:159-86, 1950. [58]
252. Thomer, G.
WIRKUNGSWEISE UND ANWENDUNG EINES DOPPEL-RÖNTGEN-BLITZ-ROHRES. (OPERATION
AND USE OF A DOUBLE X-RAY FLASH TUBE) (NRC-C-2450)
Z. angew Phys., 5:217-21, 1953. [58]
253. Thomson, J. J.
ANALYSIS BY POSITIVE RAYS OF THE HEAVIER CONSTITUENTS OF THE ATMOSPHERE,
OF THE GASES IN A VESSEL IN WHICH RADIUM CHLORIDE HAD BEEN STORED FOR
THIRTEEN YEARS AND OF THE GASES GIVEN OFF BY DEFLAGRATED METALS
Proc. Roy. Soc. A, 101:290-99, 1922. [44]
254. Thomson, J. J.
CONDUCTION OF ELECTRICITY THROUGH GASES
London: Cambridge Univ. Press, 1933. 3rd Edition, 2:431. [33]
255. Toepler, M.
BEOBACHTUNG VON METALLDAMPFSCHICHTUNG BEI ELEKTRISCHER DRAHTZERSTÄUBUNG.
(OBSERVATION OF METAL VAPOR COATING BY ELECTRICAL VAPORIZATION OF WIRES)
(57-1416)
Ann. Phys. (Leipzig), 65:873-876, 1898. [44,58]
256. Tonks, L., and Langmuir, I.
GENERAL THEORY OF THE PLASMA OF AN ARC
Phys. Rev., 34:876-922, 1929. [258]
257. Tonks, L., and Allis, W. O.
PLASMA ELECTRON DRIFT IN A MAGNETIC FIELD WITH A VELOCITY DISTRIBUTION FUNCTION
Phys. Rev., 52:710-13, 1937. [258]

258. Tonks, L.
THEORY OF MAGNETIC EFFECTS IN PLASMA OF ARC
Phys. Rev., 56:360-373, 1939.
259. Tsutsumi, Hideo
ON THE VARIATION OF ELECTRIC RESISTANCE DURING THE FUSION OF METALS. THE
TWENTIETH REPORT OF THE ALLOYS RESEARCH INSTITUTE.
Sci. Rep. Tohoku Univ., 7:93-105, 1918.
260. Uyemura, T., and Morishige, T.
STUDIES ON THE EXPLOSION MECHANISM OF ELECTRIC BLASTING CAPS BY ULTRA-HIGH-
SPEED GRID FRAMING CAMERA
J. Phys. Soc. Japan, 10:1064-7, 1955; also in International Congress on High-
Speed Photography (Third). Proceedings, New York, Academic Press, 1957.
p 96-101.
261. Vaudet, G., and Servent, R.
SPECTRES DE FILS EXPLOSES DANS L'ULTRAVIOLET LOINTAIN ET A LA REGION SCHUMAN.
(SPECTRA OF EXPLODED WIRES IN THE FAR ULTRAVIOLET AND SCHUMANN REGIONS)
C. R. Acad. Sci. (Paris), 201:195-197, 1935. [44,58]
262. Vaudet, G.
ETUDE ET EMPLOI D'UNE SOURCE LUMINEUSE DE GRANDE BRILLANCE. (STUDY AND USE
OF A LIGHT SOURCE OF GREAT BRILLIANCE) (58-600)
Ann. Phys. (Paris), 9:645-722, 1938. [44,58]
263. Ware, A. A., and Cousins, S. W.
PINCH EFFECT OSCILLATIONS IN A HIGH-CURRENT TOROIDAL RING DISCHARGE
Proc. Phys. Soc. B, 64:159-66, 1951. [35]
264. Ware, A. A.
A STUDY OF A HIGH-CURRENT TOROIDAL RING DISCHARGE
Phil. Trans. A, 243:197-220, 1951. [33]
265. Wehner, G. K.
MOMENTUM TRANSFER IN SPUTTERING BY ION BOMBARDMENT
J. Appl. Phys., 25:270-1, 1954. [58]
266. Wendt, G. L., and Irion, G. E.
EXPERIMENTAL ATTEMPTS TO DECOMPOSE TUNGSTEN AT HIGH TEMPERATURES
J. Amer. Chem. Soc., 44:1887-1894, 1922. [44,58]
267. Werle, D. K.
THE FORMATION OF METALLIC AEROSOLS
Armour Research Foundation, Ill. Inst. of Tech. Chicago, (AFCRC-TN-54-284),
September 23, 1954. 30 pp.
268. Wilson, H. A.
DIAMAGNETISM DUE TO FREE ELECTRONS
Proc. Roy. Soc., 97:321-26, 1920. [258]
269. Wrana, J.
VORGÄNGE IN SICHERUNGEN BEI ELEKTRISCHER STOSSBELASTUNG. (PROCESSES IN FUSES
SUBJECTED TO SURGE CURRENTS) (57-1418)
Electrotech Z., 59:11-13, 1938. [44]
270. Wrana, J.
VORGÄNGE BEIM SCHMELZEN UND VERDAMPFEN VON DRAHTEN MIT SEHR HOHEN STROMDICHTEN.
(PROCESSES IN THE MELTING AND VAPORIZATION OF WIRES WITH VERY HIGH CURRENT
DENSITIES) (57-2816)
Arch. Electrotech., 33:656-672, 1939. [44,58]

271. Zarem, A. M., et. al.
TRANSIENT ELECTRICAL DISCHARGES; DISINTEGRATION OF FINE WIRES (ABSTRACT)
Phys. Rev., 72:158, 1947. [44]
272. Zarem, A. M., and Marshall, F. R.
A METHOD FOR MEASURING VERY HIGH SPEED TRANSIENT CURRENTS
Rev. Sci. Instrum., 20:133-134, 1949. [44]
273. Zernow, L., and Hauver, G.
CINE-MICROSCOPY OF SPARKS, EXPLODING WIRES, AND FRACTURE AT FRAMING RATES OF
10⁶ PER SECOND (ABSTRACT)
Phys. Rev., 98:1551, 1955. [44,58]

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