HOFFMANN 88 PL B200 583 +Brechtmann, Heinrich, Benton (SIEG, USF)
PHILLIPS 88 NIM A264 125 +Fairbank, Navarro (STAN)
WADA 88 NC 11C 229 +Yamashita, Yamamoto (OKAY)
LYONS 87 ZPHY C36 363 +Smith, Homer, Lewin, Walford+ (OXF, RAL, LOIC)
MILNER 87 PR D36 37 +Cooper, Chang, Wilson, Labrenz, McKeown (CIT)
SHAW 87 PR D36 3533 +Matis, Pugh, Slansky+ (UCI, LBL, LANL, SFSU)
SMITH 87 PL B197 447 +Homer, Lewin, Walford, Jones (RAL, LOIC)
VANPOLEN 87 PR D36 1983 +Hagstrom, Hirsch (ANL, LBL)
ABACHI 86C PR D33 2733 +Shor, Barasch, Carroll+ (UCLA, LBL, UCD)
SAVAGE 86 PL 167B 481 +Bland, Hodges, Huntington, Joyce+ (SFSU)
SMITH 86 PL B171 129 +Homer, Lewin, Walford, Jones (RAL, LOIC)
SMITH 86B PL B181 407 +Homer, Lewin, Walford, Jones (RAL, LOIC)
WADA 86 NC 9C 358 (OKAY)
ALBRECHT 85G PL 156B 134 +Binder, Harder, Hasemann+ (ARGUS Collab.)
BANNER 85 PL 156B 129 +Bloch, Borer, Borghini+ (UA2 Collab.)
MILNER 85 PRL 54 1472 +Cooper, Chang, Wilson, Labrenz, McKeown (CIT)
SMITH 85 PL 153B 188 +Homer, Lewin, Walford, Jones (RAL, LOIC)
AIHARA 84 PRL 52 168 +Alston-Garnjost, Badtke, Bakker+ (TPC Collab.)
AIHARA 84B PRL 52 2332 +Alston-Garnjost, Badtke, Bakker+ (TPC Collab.)
BARWICK 84 PR D30 691 +Musser, Stevenson (UCB)
BERGSMA 84B ZPHY C24 217 +Allaby, Abt, Gemanov+ (CHARM Collab.)
BONDAR 84 JETPL 40 1265 +Kurdadze, Lelchuk, Panin, Sidorov+ (NOVO)
Translated from ZETFP 40 440.
GURYN 84 PL 139B 313 +Parker, Fries+ (FRAS, LBL, NWES, STAN, HAWA)
KAWAGOE 84B LNC 41 604 +Mashimo, Nakamura, Nozaki, Orito (TOKY)
KUTSCHERA 84 PR D29 791 +Schiffer, Frekers+ (ANL, FNAL)
MARINELLI 84 PL 137B 439 +Morpurgo (GENO)
WADA 84B LNC 40 329 +Yamashita, Yamamoto (OKAY)
AUBERT 83C PL 133B 461 +Bassompierre, Becks, Best+ (EMC Collab.)
BANNER 83 PL 121B 187 +Bloch, Bonaudi, Borer+ (UA2 Collab.)
JOYCE 83 PRL 51 731 +Abrams, Bland, Johnson, Lindgren+ (SFSU)
LIEBOWITZ 83 PRL 50 1640 +Binder, Ziock (VIRG)
LINDGREN 83 PRL 51 1621 +Joyce+ (SFSU, UCR, UCI, SLAC, LBL, LANL)
MASHIMO 83 PL 128B 327 +Orito, Kawagoe, Nakamura, Nozaki (ICEPP)
PRICE 83 PRL 50 566 +Tincknell, Tarle, Ahlen, Frankel+ (UCB)
VANDESTEEG 83 PRL 50 1234 +Jongbloets, Wyder (NIJM)
MARINI 82 PR D26 1777 +Peruzzi, Piccolo+ (FRAS, LBL, NWES, STAN, HAWA)
MARINI 82B PRL 48 1649 +Peruzzi, Piccolo+ (FRAS, LBL, NWES, STAN, HAWA)
MASHIMO 82 JPSJ 51 3067 +Kawagoe, Koshiba (INUS)
NAPOLITANO 82 PR D25 2837 +Besset+ (STAN, FRAS, LBL, NWES, HAWA)
ROSS 82 PL 118B 199 +Ronga, Besset+ (FRAS, LBL, NWES, STAN, HAWA)
HODGES 81 PRL 47 1651 +Abrams, Baden, Bland, Joyce+ (UCR, SFSU)
LARUE 81 PRL 46 967 +Phillips, Fairbank (STAN)
WEISS 81 PL 101B 439 +Abrams, Alam, Blocker+ (SLAC, LBL, UCB)
BARTEL 80 ZPHY C6 295 +Canzler, Lords, Drumm+ (JADE Collab.)
BASILE 80 LNC 29 251 +Berbiers+ (BGNA, CERN, FRAS, ROMA, BARI)
BUSSIERE 80 NP B174 1 +Giacomelli, Lesquoy+ (BGNA, SACL, LAPP)
MARINELLI 80B PL 94B 433 +Morpurgo (GENO)
Also 80 PL 94B 427 Marinelli, Morpurgo (GENO)
BOYD 79 PRL 43 1288 +Blatt, Donoghue, Dries, Hausman, Suiter (OSU)
BOZZOLI 79 NP B159 363 +Bussiere, Giacomelli+ (BGNA, LAPP, SACL, CERN)
LARUE 79 PRL 42 142 +Fairbank, Phillips (STAN)
Also 79B PRL 42 1019 Larue, Fairbank, Phillips
OGOROD... 79 JETP 49 953 Ogorodnikov, Samoilov, Solntsev (KIAE)
Translated from ZETF 76 1881.
STEVENSON 79 PR D20 82 (LBL)
BASILE 78 NC 45A 171 +Cara-Romeo, Cifarelli, Contin+ (CERN, BGNA)
BASILE 78B NC 45A 281 +Cara-Romeo, Cifarelli, Contin+ (CERN, BGNA)
BOYD 78 PRL 40 216 +Elmore, Melissinos, Sugarbaker (ROCH)
BOYD 78B PL 72B 484 +Elmore, Nitz, Olsen, Sugarbaker, Warren+ (ROCH)
LUND 78 RA 25 75 +Brandt, Fares (MARB)
PUTT 78 PR D17 1466 +Yock (AUCK)
SCHIFFER 78 PR D17 2241 +Renner, Gemmell, Mooring (CHIC, ANL)
YOCK 78 PR D18 641 (AUCK)
ANTREASYAN 77 PRL 39 513 +Cocconi, Cronin, Frisch+ (EFI, PRIN)
BASILE 77 NC 40A 41 +Romeo, Cifarelli, Giusti+ (CERN, BGNA)
BLAND 77 PRL 39 369 +Bocobo, Eubank, Royer (SFSU)
GALLINARO 77 PRL 38 1255 +Marinelli, Morpurgo (GENO)
JONES 77B RMP 69 717
LARUE 77 PRL 38 1011 +Fairbank, Hebard (STAN)
MULLER 77 Science 521 +Alvarez, Holley, Stephenson (LBL)
OGOROD... 77 JETP 45 857 Ogorodnikov, Samoilov, Solntsev (KIAE)
Translated from ZETF 72 1633.
BALDIN 76 SJNP 22 264 +Vertogradov, Vishnevsky, Grishkevich+ (JINR)
Translated from YAF 22 512.
BRIATORE 76 NC 31A 553 +Dardo, Piazzoli, Mannocchi+ (LCGT, FRAS, FREIB)
STEVENS 76 PR D14 716 +Schiffer, Chupka (ANL)
ALBROW 75 NP B97 189 +Barber+ (CERN, DARE, FOM, LANC, MCHS, UTRE)
FABJAN 75 NP B101 349 +Gruhn, Peak, Sauli, Caldwell+ (CERN, MPIM)
HAZEN 75 NP B95 189 +Hodson, Winterstein, Green, Kass+ (MICH, LEED)
JOVANOV... 75 PL 56B 105 Jovanovich+ (MANI, AACH, CERN, GENO, HARV+)
KRISOR 75 NC 27A 132 (AACH3)
CLARK 74B PR D10 2721 +Finn, Hansen, Smith (LLL)
GALIK 74 PR D9 1856 +Jordan, Richter, Seppi, Siemann+ (SLAC, FNAL)
KIFUNE 74 JPSJ 36 629 +Hieda, Kurokawa, Tsunemoto+ (TOKY, KEK)
NASH 74 PRL 32 858 +Yamanouchi, Nease, Sculli (FNAL, CORN, NYU)
ALPER 73 PL 46B 265 + (CERN, LIVP, LUND, BOHR, RHEL, STOH, BERG+)
ASHTON 73 JPA 6 577 +Cooper, Parvaresh, Saleh (DURH)
HICKS 73B NC 14A 65 +Flint, Standil (MANI)
LEIPUNER 73 PRL 31 1226 +Larsen, Sessoms, Smith, Williams+ (BNL, YALE)
BEAUCHAMP 72 PR D6 1211 +Bowen, Cox, Kalbach (ARIZ)
BOHM 72B PRL 28 326 +Diemont, Faissner, Fasold, Krisor+ (AACH)
BOTT 72 PL 40B 693 +Caldwell, Fabjan, Gruhn, Peak+ (CERN, MPIM)
COX 72 PR D6 1203 +Beauchamp, Bowen, Kalbach (ARIZ)
CROUCH 72 PR D5 2667 +Mori, Smith (CASE)
DARDO 72 NC 9A 319 +Navarra, Penengo, Sitte (TORI)
EVANS 72 PRSE A70 143 +Fancey, Muir, Watson (EDIN, LEED)
TONWAR 72 JPA 5 569 +Naranan, Sreekantan (TATA)
ANTIPOV 71 NP B27 374 +Kachanov, Kutjin, Landsberg, Lebedev+ (SERP)
CHIN 71 NC 2A 419 +Hanayama, Hara, Higashi, Tsuji (OSAK)
CLARK 71B PRL 27 51 +Ernst, Finn, Griffin, Hansen, Smith+ (LLL, LBL)
HAZEN 71 PRL 26 582 (MICH)
BOSIA 70 NC 66A 167 +Briatore (TORI)
CHU 70 PRL 24 917 +Kim, Beam, Kwak (OSU, ROSE, KANS)
Also 70B PRL 25 550 Allison, Derrick, Hunt, Simpson, Voyvodic (ANL)
ELBERT 70 NP B20 217 +Erwin, Herb, Nielsen, Petrilak, Weinberg (WISC)
FAISSNER 70B PRL 24 1357 +Holder, Krisor, Mason, Sawaf, Umbach (AACH3)
KRIDER 70 PR D1 835 +Bowen, Kalbach (ARIZ)
MORPURGO 70 NIM 79 95 +Gallinaro, Palmieri (GENO)
ALLABY 69B NC 64A 75 +Bianchini, Diddens, Dobinson, Hartung+ (CERN)
ANTIPOV 69 PL 29B 245 +Karpov, Khromov, Landsberg, Lapshin+ (SERP)
ANTIPOV 69B PL 30B 576 +Bolotov, Devishev, Devisheva, Isakov+ (SERP)
CAIRNS 69 PR 186 1394 +McCkusker, Peak, Woolcott (SYDN)
COOK 69 PR 188 2092 +Depasquali, Frauenfelder, Peacock+ (ILL)
FUKUSHIMA 69 PR 178 2058 +Kifune, Kondo, Koshiba+ (TOKY)
MCCUSKER 69 PRL 23 658 +Cairns (SYDN)
BELLAMY 68 PR 166 1391 +Hofstadter, Lakin, Perl, Toner (STAN, SLAC)
BJORNBOE 68 NC B53 241 +Damgard, Hansen+ (BOHR, TATA, BERN, BERG)
BRAGINSK 68 JETP 27 51 +Zeldovich, Martynov, Migulin (MOSU)
Translated from ZETF 54 91.
BRIATORE 68 NC 57A 850 +Castagnoli, Bollini, Massam+ (TORI, CERN, BGNA)
FRANZINI 68 PRL 21 1013 +Shulman (COLU)
GARMIRE 68 PR 166 166 +Leong, Sreekantan (MIT)
HANAYAMA 68 CJP 46 S734 +Hara, Higashi, Kitamura, Miono+ (OSAK)
KASHA 68 PR 172 1297 +Stefanski (BNL, YALE)
KASHA 68B PRL 20 217 +Larsen, Leipuner, Adair (BNL, YALE)
KASHA 68C CJP 46 S730 +Larsen, Leipuner, Adair (BNL, YALE)
RANK 68 PR 176 1635 (MICH)
BARTON 67 PRSL 90 87 (NPOL)
BATHOW 67 PL 25B 163 +Freytag, Schulz, Tesch (DESY)
BUHLER 67 NC 49A 209 +Fortunato, Massam, Zichichi (CERN, BGNA)
BUHLER 67B NC 51A 837 +Dalpiaz, Massam, Zichichi (CERN, BGNA, STRB)
FOSS 67 PL 25B 166 +Garelick, Homma, Lobar, Osborne, Uglum (MIT)
GOMEZ 67 PRL 18 1022 +Kobrak, Moline, Mullins, Orth, VanPutten+ (CIT)
KASHA 67 PR 154 1263 +Leipuner, Wangler, Alspector, Adair (BNL, YALE)
STOVER 67 PR 164 1599 +Moran, Trischka (SYRA)
BARTON 66 PL 21 360 +Stockel (NPOL)
BENNETT 66 PRL 17 1196 (YALE)
BUHLER 66 NC 45A 520 +Fortunato, Massam, Muller+ (CERN, BGNA, STRB)
CHUPKA 66 PRL 17 60 +Schiffer, Stevens (ANL)
GALLINARO 66 PL 23 609 +Morpurgo (GENO)
KASHA 66 PR 150 1140 +Leipuner, Adair (BNL, YALE)
LAMB 66 PRL 17 1068 +Lundy, Novey, Yovanovitch (ANL)
DELISE 65 PR 140B 458 +Bowen (ARIZ)
DORFAN 65 PRL 14 999 +Eades, Lederman, Lee, Ting (COLU)
FRANZINI 65B PRL 14 196 +Leontic, Rahm, Samios, Schwartz (BNL, COLU)
MASSAM 65 NC 40A 589 +Muller, Zichichi (CERN)
BINGHAM 64 PL 9 201 +Dickinson, Diebold, Koch, Leith+ (CERN, EPOL)
BLUM 64 PRL 13 353A +Brandt, Cocconi, Czyzewski, Danysz+ (CERN)
BOWEN 64 PRL 13 728 +Delise, Kalbach, Mortara (ARIZ)
HAGOPIAN 64 PRL 13 280 +Selove, Ehrlich, Leboy, Lanza+ (PENN, BNL)
LEIPUNER 64 PRL 12 423 +Chu, Larsen, Adair (BNL, YALE)
MORRISON 64 PL 9 199 (CERN)
SUNYAR 64 PR 136B 1157 +Schwarzschild, Connors (BNL)
HILLAS 59 Nature 184 B92 +Cranshaw (AERE)
MILLIKAN 10 Phil Mag 19 209 (CHIC)

OTHER RELATED PAPERS

LYONS 85 PRPL C129 225 (OXF)
Review
MARINELLI 82 PRPL 85 161 +Morpurgo (GENO)
Review

Magnetic Monopole Searches

NOTE ON MAGNETIC MONOPOLE SEARCHES

(by W.P. Trower, Virginia Polytechnic Institute and State University)

Although the usual formulation of Maxwell's equations suggests magnetic monopoles, no observed phenomenon requires them for explanation [1]. A monopole anywhere in the universe results in electric charge quantization everywhere, and leads to the prediction of a least magnetic charge $G = e/2\alpha$, the Dirac charge [2]. Recently monopoles have become indispensable in many gauge theories, which endow them with a variety of extraordinarily large masses.

Monopole detectors have predominantly used either induction or ionization. Induction experiments measure the monopole magnetic charge and are independent of monopole electric charge, mass, and velocity. Monopole candidate events (CABRERA 82, CAPLIN 86) in single semiconductor loops have been detected by this method, but no two-loop coincidence has been observed. Ionization experiments rely on a magnetic charge producing more ionization than an electrical charge with the same velocity. However, the ability to distinguish a monopole by ionization diminishes with velocity.

Cosmic rays are the most likely source of massive monopoles, since accelerator energies are insufficient to produce them. Evidence for such monopoles may also be obtained from astrophysical observations.

This compilation is only a guide to the literature, since the quoted experimental limits are often only indicative.

References

1. J.D. Jackson, CERN-77-17 (1977).
2. P.A.M. Dirac, Proc. Royal Soc. London **A133**, 60 (1931).