

Professor Doctor Zohreh Parsa

VITAE



Dr. Zohreh Parsa,
Physicist, Professor, Chief Scientist,
Executive, PhD, MS, BS.

PERSONAL DATA:

CITIZENSHIP: USA

ADDRESS: Physics Department 510A,
Brookhaven National Lab,
Upton, New York 11973-5000

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Professor Doctor Zohreh Parsa

EDUCATION AND PROFESSIONAL EXPERIENCE:

EDUCATION: Ph.D. in Physics, New York Polytechnic University, 1977

*Doctoral Dissertation: Topological Solitons:
Vortices, Magnetic Monopoles And Instantons.*

M. S. in Physics, New York University, New York

B. S. in Physics, Delaware College, Delaware.

RESEARCH INTEREST:

Physics Interests Spans, Nuclear Physics, Particle Physics, Collider Physics (ILC, LHC, Muon Collider, SSC ...); Non-Linear Physics/ Dynamics; Muon Physics, Neutrino Physics. Including Neutrino/ CP violation and Very Long Baseline Neutrino (LBN/LBNE) Studies She Started In 1998, That Envisioned Sending A Very Intense Neutrino Beam Through The Earth To A "Far Away", Large Detector To Search For Physics Potentials For Making Precision Measurements Of All Neutrino Oscillation Parameters, CP violation, Proton Decay and Natural Sources of Neutrinos Such As Supernova. "Very Long Distance" Is The Key To This Approach And The Physics You Can Do. Etc.

POSITIONS & RELEVANT EXPERIENCE:

Dr. Parsa, Physicist, Department of Energy's Brookhaven National Lab (1985-)
Tenured Physics Faculty, New Jersey Institute of Technology (1977-1984);

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Physics Lecturer (Adjunct), Hunter College of CUNY (1974-1976);
Director of Physics and Engineering Labs, Essex C. College (1972 -1974).
Professor, University of California, Santa Barbara (1996-1997).
Visiting Scientist, Univ. Mainz, Germany (May 2011- Summer 2012 & 2003).
Visiting Scientist, Univ. Karlsruhe, Germany (May-Aug 2002 & 2003).
Visiting Scientist in Reactor Group, Brookhaven National Laboratory (1977-84);
Visiting Professor, Institute for Nuclear Theory, Univ. of Washington, Seattle.
Visiting Scholar, Northwestern University, Evanston ILL (1980-1981);
Visiting scientist Physics and Reactor Group Brookhaven National Lab (1977-84)
Visiting Scholar, Aspen Center for Physics, Aspen Colorado and Los Alamos etc.

CHAIR, COORDINATOR, ORGANIZER:

Coordinator, organizer of the first US long term Particle and Accelerator Research Program “New Ideas for Particle – Accelerators”, (5months) Program at the Institute for Theoretical Physics, in Santa Barbara, California (July - December 1996). [A unique feature of the Program (and symposium) was the bringing together of many physicists who will have a major impact on the future direction of the field. Many topics we worked on during the 5 months program led to National and International Physics projects in particle and accelerator physics. The program and symposium were funded by the National Science Foundation.]

Chairperson, organizer of the Symposium: “New Modes of Particle Acceleration –

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Techniques and Sources”, Santa Barbara, California August 19-23, 1996.

[Highlights of that meeting included Novel Modes of laser, plasma, and wake - field acceleration, techniques, and power sources.]

Chairperson, and organizer of the Symposium on “Future High Energy Colliders”, Santa Barbara, California October 21-25, 1996.

[Especially interesting were set of presentations made by the Department of Energy Director of Energy Research; by National Science Foundation; and by the Directors of the three U.S. High Energy Physics Laboratories (BNL, FNAL, and SLAC). Their perspectives, combined with presentations by Internationally distinguished high energy and accelerator physicists, provided a comprehensive picture of the issues involved in formulating goals for the future, and should provide a valuable input for ongoing discussions in making decisions regarding the future direction of the field. Also see: Z. Parsa, Future High Energy Colliders Summary Report:, BNL-52524 , 1996; and Z. Parsa, “Collision Crossroads, CERN Courier” Vol 37, 2, March 1997, Ed. G. Fraser.]

Chairperson, and organizer of the 3rd Symposium on “Beam Stability and Nonlinear Dynamics” Santa Barbara, California December 3-5, 1996

[Dealt with the fundamental theoretical Nonlinear dynamics problems associated with particle- accelerator physics.];

Chair of the CIPANP Local organizing committee and member of “Intersection organizing committee” for the 8th Conference on “Intersection of Particle and Nuclear Physics”, in New York City, May 2003.

[The conference we organized in New York City provided an interesting

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location for many participants who attended the CIPANP2003, where the BNL RHIC preliminary results were presented, in addition to the Particle, Nuclear, and related topics. The program was well attended with over 500 participants.]

Chairperson and Organizer of the American Physical Society - New York State Section Topical Symposium on “Particle Accelerator Frontiers and New Physics Potentials”, Brookhaven National Laboratory, Upton New York, October 2003;

Chairperson and organizer of the BNL Particle and Accelerator Physics Seminars, for 12 years (1987-1999).

[The biweekly seminar topics covered Particle Physics, Accelerator Physics, and in between topics. It was well attended, with participants from various Physics groups at the laboratory.]; etc.

PROFESSIONAL MEMBERSHIPS & ELECTED POSITIONS :

Elected Executive committee member of New York State Section of the American Physical Society (2001-2005);

Elected Chairperson of Upton Digital Equipment Corporation Users Society (DECUS) Upton Section and BNL Computer Local Users Groups (LUG) 1986-99. [The monthly LUG meetings took place for over 13 years, and was well attended by participants from Groups, Divisions and outside of the BNL. It provided a Forum for the participants from all fields to learn about new computer technology and provided a question and answer session between participants and local and visiting computer grues. Talks and discussions included VAX VMS, IBM, Unix (Linux), PC, Networking and Storage problems and solutions.] ; etc.

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MEMBERSHIP:

Member of DUNE collaboration

Member of Long Baseline Neutrino Experiment (LBNE) Collaborations ;

Member of the International Linear Collider (ILC) Collaboration; (1992-);

Member of Muon Collider and Neutrino Factory Collaborations (1993-);

Member & Team Leader of the US State Department Funded Projects, with Former Nuclear Weapon Scientists e.g. from Ukraine (1999 – 2005), etc.

Elected Member of Executive committee of the American Physical Society New York State Section (2001 - 2005);

Member of American Physical Society;

Member of Division of Particles and Fields (DPF);

Member of Division of Nuclear Physics (DNP);

Member, organizer & Chair of BNL biweekly Particle and Accelerator

Physics seminars, Physics Department Seminar Room (1987-1999);

Member & Elected Chair of (DECUS) Digital Equipment Corporation Users Society Upton Section (1986-1999);

Member & Chair of BNL the Computer Local Users Group (LUG) ,13 years ;

Member of Cyber Administration, BNL; etc.

Referee & Author of Physics Journals, Research Publications, (Physics and computer) Manuals.

EDITORSHIPS: Editor-in-Chief of the American Physical Society New York State Section “Physics Newsletter” (2000-2005). Editor of the

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Inaugural Newsletter Issue (started) Vol 1 in 2002, Volume 2, 2003, Volume 3, 2004.., (4000 copies of each vol. was printed, paid for & distributed by the American Physical Society; Editor for Physics Conference Proceedings, Books; etc.

Editor of 5 + BOOKS:

“New Modes of Particle Acceleration – Techniques and Sources”;
Zohreh Parsa (ed), AIP CP 396, AIP Press, Woodbury, New York
(1997), 211 pages. ISBN 1-56396-728-6, Printed in USA.

“Future High Energy Colliders” Zohreh Parsa (ed), AIP CP 397; American
Institute of Physics Press, (1997). Woodbury, New York (1997), 378
pages. ISBN 1-56396-729-4.

“Beam Stability and Nonlinear Dynamics”, Zohreh Parsa (ed), AIP CP
405”, AIP Press, Woodbury, New York (1997), 245 pages.
ISBN 1-56396-731-6.

“Intersections of Particle and Nuclear Physics” 7th conference,
Zohreh Parsa, William Marciano (ed), AIP CP 549, American Institute of
Physics, Melville, New York, 1040 pages (2001). ISBN 1-56396-978-5.

“Intersections of Particle and Nuclear Physics” 8th conference, AIP CP
698. Zohreh Parsa (ed), AIP Press, Melville, N.Y. 1000 pages (2003),
ISBN 0-7354-0169-1, Printed in USA.

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Partial Pulication List

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Report of the Quark Flavor Physics Working Group. By Quark Flavor Physics Working Group Collaboration (J.N. Butler et al.). Nov 5, 2013. arXiv: 1311.1076[hep-ex].

Neutrinos. By Intensity Frontier Neutrino Working Group Collaboration (A. de Gouvea et al.). Oct 16, 2013, 89pp. arXiv:1310.4340 [hep-ex].

Scientific Opportunities with the Long-Baseline Neutrino Experiment. By LBNE Collaboration (C. Adams et al.). Jul 28, 2013. 205 pp. arXiv:1307.7335 [hep-ex].

Fundamental Physics at the Intensity Frontier. By J.L. Hewett, et al.. May 2012. 229 pp. arXiv:1205.2671 [hep-ex]. SLAC-R-991.

The 2010 Interim Report of the Long-Baseline Neutrino Experiment Collaboration Physics Working Groups By LBNE Collaboration (T. Akiri et al.). Oct 2011. 113 pp. arXiv:1110.6249 [hep-ex]. LBNE-PWG-004.

Long Baseline Neutrino Experiments and Underground Facilities . By Maury Goodman, Bruce King, Zohreh Parsa, Fritz de Jong, Steve Geer, Jorge Morfin, et al.. 2012.

Flavor Physics in the Quark Sector. By Mario Antonelli et al.. arXiv:0907.5386

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[hep-ph]. Phys.Rept. 494 (2010) 197-414.

Review of Particle Physics. By Particle Data Group Collaboration (Claude Amsler et al.). 2008. 1340 pp. Phys.Lett. B667 (2008) 1-1340.

ILC Reference Design Report Volume 4 - Detectors. By ILC Collaboration (Ties Behnke et al.). Dec 2007. arXiv:0712.2356 [physics.ins-det].

ILC Reference Design Report: ILC Global Design Effort and World Wide Study. By ILC Collaboration (James Brau et al.). Aug 2007. 147 pp. arXiv:0712.1950 [physics.acc-ph].

International Linear Collider Reference Design Report Volume 2: Physics at the ILC. By ILC Collaboration (Gerald Aarons et al.). Sep 2007. 149 pp. arXiv:0709.1893 [hep-ph].

Report of the US long baseline neutrino experiment study. By V. Barger, et al.. May 2007. 109 pp. arXiv:0705.4396 [hep-ph]. BNL-77973-2007-IR.

Intense neutrino beams and leptonic CP violation. By William Marciano, Zohreh Parsa. Oct 2006. 7 pp. Nucl.Phys.Proc.Suppl. 221 (2011) 166-172. BNL-HET-06-14 hep-ph/0610258.

Proposal for an Experimental Program in Neutrino Physics and Proton Decay in the Homestake Laboratory. By M. Diwan, Steven H. Kettell, L. Littenberg, W. Marciano, Z. Parsa, N. Samios, et al.. 2006. 47 pp. hep-ex/0608023.

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BNL-76798-2006-IR.

Physics of an intense neutrino beam from BNL to a very long baseline detector.

By Zohreh Parsa. 2004. 7 pp. AIP Conf.Proc. 698 (2004) 307-313.

Intersections of particle and nuclear physics. Proceedings, 8th Conference, CIPANP 2003, New York, USA, May 19-24, 2003. By Zohreh Parsa. Published in AIP 698 1-855 p. (2003). ISBN 0-7354-0169-1, 2003.

Neutrino electron scattering theory. By William J. Marciano, Zohreh Parsa. 2003, 20pp. Published in Particle and Nuclear Physics Journal G (Nov 2003). J.Phys. G29 2629-2645. (2003); ibid hep-ph/0403168.

The neutrino superbeam from the AGS By W.T. Weng, D. Beavis, M. Brennan, et al.. 2003. 4 pp. J.Phys. G29 (2003) 1735-1738.

AGS super neutrino beam facility accelerator and target system design: Neutrino working group report II. By M. Diwan, et al.. May 2003. 114 pp. BNL-71228-2003-IR. hep-ex/0305105.

Very long baseline neutrino oscillation experiments for precise measurements of mixing parameters and CP violating effects. By M.V. Diwan, et al.. May 2003. 114 pp. hep-ph/0303081. Phys.Rev. D68 (2003) 012002.

Scenarios for BNL neutrino superbeam and oscillation experiment. By Zohreh Parsa. Jun 2002. C02-06-03.1, p.1037-1039.

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Neutrino factories: Physics potentials. By Zohreh Parsa. 2000. AIP Conf.Proc. 549 (2000) 781-789.

Report of the BNL neutrino working group: Very Long Baseline Neutrino Oscillation Experiment for Precise Determination of Oscillation Parameters and Search for $\nu_{\mu} \rightarrow \nu_e$ appearance and CP Violation. By M. Diwan, et al.. Oct 2002. 100 pp. BNL-69395. hep-ex/0211001

Recent progress in neutrino factory and muon collider research within the Muon collaboration. By Muon Collider/Neutrino Factory Collaboration (Mohammad M. Alsharoa et al.). 2002. 103 pp. hep-ex/0207031. Phys.Rev.ST Accel.Beams 6 (2003) hep-081001.

Neutrino Oscillation Experiments for precise measurements of oscillation parameters and search for muon-neutrino \rightarrow electron-neutrino appearance and CP violation: Letter of intent to Brookhaven National Laboratory. By D. Beavis, et al.. Apr 2002. 39 pp. hep-ex/0205040.

A Scenario for a Brookhaven neutrino super beam experiment. By M.V. Diwan, S.A. Kahn, R.B. Palmer, Zohreh Parsa, I. Stumer, K.T. McDonald. Jun 2001. 5 pp. in C010630 (2001) E103. SNOWMASS-2001-E103.

Neutrino Factory - Ionization Cooling, Emittance Exchange, and ν Superbeam at BNL. By Zohreh Parsa. Conf.Proc. C0106181 (2001) 3864-3866.

Higgs Factory and Potentials. By Zohreh Parsa. Aug 2001. Conf.Proc. C0106181 (2001) 3338-3340.

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Neutrino Factory based on Muon-Storage-Rings to Muon Colliders: Physics and Facilities. By Zohreh Parsa. Conf.Proc. C0106181 (2001) 3335-3337.

E1 Working Group summary: Neutrino factories and muon colliders. By T. Adams, et al.. Nov 2001. 24 pp. hep-ph/0111030. *ibid*, eConf C010630 (2001) E1001.

Feasibility study 2 of a muon based neutrino source. By S. Ozaki, et al.. Nov 2001. 24 pp. BNL-52623. Jun 2001. 544 pp.

Physics at high luminosity mu⁺- colliders and a facility overview. By Zohreh Parsa. Oct 2000. 10 pp. In *Upton 2000/2001, Muon colliders at the high energy frontier*. in C00-10-23.7 Proceedings; *ibid*, BNL-68851.

Muon sources. By Zohreh Parsa. May 2000. 10 pp. AIP Conf.Proc. 549 (2000) 831-840. *ibid*, BNL-68141.

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Future lepton colliders and laser acceleration. By Zohreh Parsa. 2000. Int.J.Mod.Phys. A15 (2000) 2565-2575.

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A Feasibility study of a neutrino source based on a muon storage ring. By N. Holtkamp, et al.. Jun 2000. 158 pp. Published in: Phys.Rev.ST Accel.Beams.

Intersections of particle and nuclear physics. Proceedings, 7th Conference (CIPANP 2000), Quebec City, Quebec, Canada, 22-28 May 2000. By Zohreh Parsa, William J. Marciano. (2000). AIP Conf.Proc.549:1-1020, 2000.

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Expression of interest for R & D towards a neutrino factory based on a storage ring and a muon collider. By Neutrino Factory and Muon Collider Collaboration (D. Ayres et al.). Nov 1999. 50 pp. physics/9911009 [physics.acc-ph].

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Intense muon beams and neutrino factories. By Zohreh Parsa. Dec 1999. 12 pp.
Published in AIP Conf.Proc. 542 (2000) 236-247; *ibid*, BNL-67823.

Muon dynamics and ionization cooling at muon colliders. By Zohreh Parsa. Jun
1998. C98-06022, p.1055-105.

Polarization effects at a muon collider. By Zohreh Parsa. Jun 1998. C98-06-22, p.
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A formula for the integration of radiation using Yoshida's Lie methods. By E.
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Polarization and luminosity requirement for the first muon collider
By Zohreh Parsa. 1998, in C98-07-06.4.; AIP Conf.Proc. 472 (1999) 251-259.

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muon collider. By Charles M. Ankenbrandt, et al.. Apr 1998. 75 pp.
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Lasers and Future High Energy Colliders. By Z. Parsa. Dec 1997. 8 pp. in
C97-12-15.3. *Ibid*, BNL-65251.

New High Intensity Muon Sources and Flavor Changing Neutral Currents
By Z. Parsa. Feb 1997. 7 pp. In C97-02019 Proceedings; *ibid*, BNL-64528.

Development of Extremely High Current Positron Sources and Applications
By V.V. Gorev, Z. Parsa. May 1997; in C97-05-12.

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Longitudinal Ionization Cooling of Muons. By Z. Parsa, P. Zenkevich. May 1997
in C97-05012.

Beam Matching and Halo Control. By W.P. Lysenko, Z. Parsa. May 1997.
Published in Conf.Proc. C970512 (1997) 1917.

Halo control, beam matching, and new dynamical variables for beam distributions
By W. Lysenko, Zohreh Parsa. 1997. AIP Conf.Proc. 405 (1997) 211-222.

High Intensity Muon Sources. By Z. Parsa. in Conf.Proc. [C97-05-12](#). (1997) .
Ionization cooling and muon dynamics. By Zohreh Parsa. AIP Conf.Proc. 441
(1998) 289-294. C97-12-10.

Resonant Higgs enhancement at the first muon collider. By Basim Kamal,
William J. Marciano, Zohreh Parsa. AIP Conf.Proc. 441 (1998) 174-179.

Application of moments method to dynamics of muon cooling system By
Zohreh Parsa, P. Zenkevich. AIP Conf.Proc. 405 (1997) 183-188; *ibid*,
BNL-64526

Kinetics of muon longitudinal cooling. By Zohreh Parsa, P. Zenkevich. 1997.
AIP Conf.Proc. 405 (1997) 165-172.

Inverse free electron laser acceleration with a square wave wiggler. By
Zohreh Parsa, M.P. Pato. 1997. AIP Conf.Proc. 396 (1997) 179-189.

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Enhanced IFEL performance using a novel wiggler. By Zohreh Parsa, T.C. Marshall. May 1997. in Conf.Proc. C970512 (1997) 642-644.

Beam stability and nonlinear dynamics. Proceedings, Symposium, Santa Barbara, USA, December 3-5, 1996 By Zohreh Parsa (ed), Published in New York, USA: AIP (1997) 237 p. (AIP conference proceedings. 405).

Future high-energy colliders. Proceedings, Symposium, Santa Barbara, USA, October 21-25, 1996 By Zohreh Parsa. 1997. Published in Woodbury, USA:AIP (1997) 368 p. (AIP conference proceedings. 397).

New modes of particle acceleration - techniques and sources. Proceedings, Symposium, Santa Barbara, USA, August 19-23, 1996. By Zohreh Parsa. 1997. Published in Woodbury, USA: AIP (1997) 201 p. (AIP conf. proceedings. 396).

Higgs resonance studies at the first muon collider. By Basim Kamal, William J. Marciano, Zohreh Parsa. hep-ph/9712270. AIP Conf.Proc. 435 (1998) 657-662.

Symplectic integration By Zohreh Parsa, E. Forest. AIP Conf.Proc. 395(1997) 355-368.

Rare kaon decays with 'missing energy. By W. J. Marciano, Zohreh Parsa. Phys.Rev. D53 (1996) 1-5.

mu+ mu- Collider: Feasibility Study. By J.C. Gallardo, et al.. in eConf C960625 (1996) R4. *ibid*, in SLAC-R-988, BNL-52503, FERMILAB-CONF-96-092, LBL-38946.

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Nucl.Phys.Proc.Suppl. 51A (1996) 61-84.

Working group summary: Machine design for the mu+ mu- collider. By
K. Hirata, et al.. AIP Conf.Proc. 372 (1996) 330-335. *ibid*, SLAC-
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1995. 15 pp. hep-ph/9503258. AIP Conf.Proc. 352 (1996) 55-69.

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Effects of the third order transfer maps and solenoid on a high brightness
beam. By Zohreh Parsa. Conf.Proc. C930517 (1993) 509-511.

Operation of the Brookhaven National Laboratory Accelerator Test
Facility By K. Batchelor, et al. Aug. 1992 C92-08-24.2, p.178-180.

Integration of transients in axisymmetrical cavities for accelerators:
Formulation and applications to BNL photocathode gun. By Zohreh Parsa,
Luca Serafini. Apr 1992. 41pp. BNL-52329, CAP-83-ATF-92R.

On dynamic aperture. By Zohreh Parsa. Conf.Proc. C910506 (1991) 1
887-1889.

Beam emittance and the effects of the RF, space charge and wake fields:

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Application to the ATF photoelectron beam. By Zohreh Parsa. Conf.Proc. C910506 (1991) 511-513.

Wake field and space charge effects on high brightness beams: Calculations and measured results for the laser driven photoelectrons at BNL-ATF.

By Zohreh Parsa. In *Brookhaven 1991, Accelerator physics and modeling* 63-163.

Accelerator physics and modeling. Proceedings, Symposium, Brookhaven National Lab, Upton, NY, USA, September 17, 1991. By Zohreh Parsa (ed) Published in Upton, USA: BNL (1991) 289 p. ; BNL-52379 .

Interactions between charged particles and RF, space charge and wake fields in an accelerating structure By Zohreh Parsa. In *Vancouver 1991, Particles and fields '91, vol. 2* 1073-1075.

On beam emittance and invariants: Applications to ATF beamline. By Zohreh Parsa. Conf.Proc. C900612 (1990) 1747-1749.

The Brookhaven Accelerator Test Facility. By D.P. Russell, et al.. In *Houston 1990, Proceedings, Rice Meeting, vol. 2* 975-978.

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Parsa, L. Young. 1990. 22 pp. BNL-44751.

Brookhaven accelerator test facility photocathode gun and transport beamline.

By Zohreh Parsa, Lloyd Young. 1990. 62 pp. BNL-44749.

Beam Behavior Studies In Accelerators Using Perturbation Theory. By Zohreh Parsa, S. Tepikian. 1988. Part.Accel. 22 (1988) 307-318.

Second Order Perturbation Theory For Accelerators By Zohreh Parsa, S.Tepikian, E.Courant. 1987. Part.Accel. 22 (1987) 205-230.

The AGS Booster Lattice. By Y. Lee, et al.. 1987. Conf.Proc. C870316 (1987) 865. BNL-39404.

Chromatic Perturbation and Resonance Analysis for the AGS Booster.

By Zohreh Parsa. Mar 1987. Conf.Proc. C870316 (1987) 1173. BNL-39451.

Electroweak Tests of the Standard Model. By W.J. Marciano, Zohreh Parsa. Ann.Rev.Nucl.Part.Sci. 36 (1986) 171-205.

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Linear Aperture, Smear, Variation Of Particle Action And Beam Emittance In the SSC. By Zohreh Parsa. Oct 1986. 10 pp. in SSC-N-256. *ibid*, BNL-SSC-55.

Resonance With Analysis For SSC With Harmon And Nonlin. By Zohreh Parsa. Oct 1986. 21 pp. SSC-N-258, *ibid*, BNL-SSC-57, *ibid*, CDG-SSC-N-258.

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N-257; *ibid*, BNL-SSC-56; *ibid*, CDG-SSC-N-257.

Second Order Perturbation In SSC. By Zohreh Parsa. Oct 1986. 14 pp. In SSC-N- 255. *ibid* BNL-SSC-54; CDG-SSC-N-255.

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