Technical Writings*

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Contributions to International Reports:

1. ⋯, A. Sameen KHAN, ⋯, (*one of the 300+ Contributors, from 73 Institutions*),
   Particle Physics Experiments at JLC,
   ACFA Linear Collider Working Group Report,
   KEK Report 2001-11 (August 2001).
   JLC: Electron-Positron Linear Collider Project.
   E-Print: http://arXiv.org/abs/hep-ph/0109166/.

2. ⋯, Sameen Ahmed KHAN, ⋯, (*one of the 500+ Contributors, from 121 Institutions*),
   GLC Project Linear Collider for TeV Physics,
   KEK Report 2003-7 (September 2003).
   GLC: Global Linear Collider.

3. ⋯, Sameen Ahmed KHAN, ⋯, (*one of the 250+ Contributors, from 79 Institutions*),
   GLD Detector Outline Document (**GLD DOD**),
   GLD: A Large Detector Concept study for International Linear Collider for TeV Physics
   Report of the
   GLD Concept Study Group,
   World Wide Study of Physics and Detectors for future Linear e^+e^- Colliders, (March 2006).
   GLD: Gaseous tracker based Large Detector.
   E-Print: http://arXiv.org/abs/physics/0607154/.

4. ⋯, Sameen Ahmed KHAN, ⋯, (*one of the 500+ Contributors, from 325 Institutions*),
   International Linear Collider Reference Design Report, (*Four Volumes*)
   ILC Global Design Report and World Wide Study,
   (August 2007).
   ILC: International Linear Collider.
   E-Print: http://arxiv.org/abs/0712.1950/.

A. Review Article

1. R. Jagannathan and S. A. Khan,
   Quantum theory of the optics of charged particles,
   Invited article in:
   Advances in Imaging and Electron Physics, *Editors*: P. W. Hawkes, B. Kazan and T. Mulvey,
   (Academic Press, San Diego, 1996) **Vol. 97**, pp. 257-358 (1996).

2. Sameen Ahmed Khan,
   Wavelength-Dependent Effects in Light Optics,
   in *New Topics in Quantum Physics Research*,
   Editors: Volodymyr Krasnoholovets and Frank Columbus,
   (Nova Science Publishers, New York, 2006, http://www.novapublishers.com/).
   pp. 163-204 (30 December 2006).
   (ISBN-10: 1600210287 and ISBN-13: 978-1600210280).

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3. Sameen Ahmed Khan,
The Foldy-Wouthuysen Transformation Technique in Optics,
Invited article in:
Advances in Imaging and Electron Physics, *Editor*: Peter W. Hawkes,
(Elsevier, 2008) **Vol. 152**, pp. 49-78 (August 2008).
(ISBN-10: 0123742196 and ISBN-13: 978-0-12-374219-3).

B. Refereed Publications

1. S. A. Khan and R. Jagannathan,
On the quantum mechanics of charged particle beam transport through magnetic lenses,
Physical Review **E 51**, 2510-2515 (March 1995).

2. M. Conte, R. Jagannathan, S. A. Khan and M. Pusterla,
Beam optics of the Dirac particle with anomalous magnetic moment,
Particle Accelerators **56**, 99-126 (1996).

3. S. A. Khan and M. Pusterla,
Quantum-like approach to the transversal and longitudinal beam dynamics. The halo problem,
European Physical Journal **A 7** No. 4, 583-587 (2000).

4. Sameen Ahmed Khan and Modesto Pusterla,
Quantum approach to the halo formation in high current beams,
Nuclear Instruments and Methods in Physics Research (NIMS) **A 464**, Issue 1-3, 461-464 (May 2001).
Refereed Proceedings of the *13th International Symposium on Heavy Ion Inertial Fusion* (**HIF2000**) (13-17 March 2000, San Diego, USA).

5. Sameen Ahmed Khan and Kurt Bernardo Wolf,
Hamiltonian orbit structure of the set of paraxial optical systems,
Journal of the Optical Society of America **A 19** (12), 2436-2444 (December 2002).

6. Sameen Ahmed Khan,
Wavelength-dependent modifications in Helmholtz Optics,
International Journal of Theoretical Physics, **44**(1), 95-125 (January 2005).
(Kluwer Academic Publishers, https://www.editorialmanager.com/ijtp/).

7. Sameen Ahmed Khan,
An Exact Matrix Representation of Maxwells Equations,
Physica Scripta, **71**(5) 440-442 (2005).
(http://www.physica.org/).

8. Sameen Ahmed Khan,
The Foldy-Wouthuysen Transformation Technique in Optics,
Optik-International Journal for Light and Electron Optics, **117**, Issue 10, pp. 481-488 (October 2006).
(http://www.elsevier-deutschland.de/ijleo/).

9. Sameen Ahmed Khan,
Maxwell Optics of Quasiparaxial Beams,
Optik-International Journal for Light and Electron Optics, **120**, Issue ??, pp. ???-??? (??? 2009).
(http://www.elsevier-deutschland.de/ijleo/).
(*in press*, Digital Object Identifier, http://dx.doi.org/10.1016/j.ijleo.2008.07.027).

10. Sameen Ahmed Khan and Modesto Pusterla,
On the form of Lorentz-Stern-Gerlach force,
10 pages, (*communicated*).

11. Sameen Ahmed Khan, Ramaswamy Jagannathan and Rajiah Simon,
Foldy-Wouthuysen transformation and a quasiparaxial approximation scheme for the scalar wave theory of light beams,
14 pages, (*communicated*).

12. Sameen Ahmed Khan,
Wavelength-dependent modifications in Maxwell Optics,
59 pages, (*communicated*).

The corrections to the traditional descriptions rigorously derived in the above articles have a significant bearing on the celebrated Scherzer Theorem in the wavelength-dependent regime in electron microscopy and the algebraically equivalent system of fiber optics. An application shall be made for a patent in the near future!

C. E-Prints†
http://arXiv.org/

1. Sameen Ahmed Khan,
An alternate way to obtain the aberration expansion in Helmholtz Optics,
40 pages, *E-Print*: http://arXiv.org/abs/physics/0210001/.
2. Sameen Ahmed Khan,
Maxwell Optics: I. An exact matrix representation of the Maxwell equations in a medium,
10 pages, *E-Print*: http://arXiv.org/abs/physics/0205083/.
3. Sameen Ahmed Khan,
Maxwell Optics: II. An Exact Formalism,
23 pages, *E-Print*: http://arXiv.org/abs/physics/0205084/.
4. Sameen Ahmed Khan,
Maxwell Optics: III. Applications,
13 pages, *E-Print*: http://arXiv.org/abs/physics/0205085/.
5. Sameen Ahmed Khan,
Wavelength-Dependent Effects in Maxwell Optics,
58 pages, *E-Print*: http://arXiv.org/abs/physics/0210027/.

D. In Proceedings & Preprints

1. S. A. Khan and R. Jagannathan,
Theory of relativistic electron beam transport based on the Dirac equation,
in: *Proceedings of the 3rd National Seminar on Physics and Technology of Particle Accelerators and their Applications* **PATPAA-93**, (25-27 November 1993, Kolkata (Calcutta)),
Editor: S. N. Chintalapudi (IUC-DAEF, Kolkata (Calcutta)), pp. 102-107 (1996).
2. S. A. Khan and R. Jagannathan,
Quantum mechanics of charged particle beam optics: An operator approach,
Preprint: IMSc-94/11 Presented at the **JSPS-KEK** International Spring School on High Energy Ion Beams — Novel Beam Techniques and their Applications, Japan, 17-29 March 1994.
3. R. Jagannathan and S. A. Khan,
Wigner functions in charged particle optics,
in: Selected Topics in Mathematical Physics — Professor R. Vasudevan Memorial Volume,
Editors: R. Sridhar, K. Srinivasa Rao, and V. Lakshminarayanan
(Allied Publishers, Delhi, 1995), pp. 308-321 (1995).
4. S. A. Khan,
Transport of Dirac-particle beams through magnetic quadrupoles,
`Preprint: IMSc/96/33` (The Institute of Mathematical Sciences, Chennai (Madras), Dec. 1996).

†These E-Prints are being rewritten as long *Reports* or/and *Review Articles*

5. R. Jagannathan and S. A. Khan,
Quantum mechanics of accelerator optics,
ICFA Beam Dynamics Newsletter, **13**, pp. 21-27 (April 1997).
(**ICFA**: International Committee for Future Accelerators).
6. S. A. Khan,
Quantum theory of magnetic quadrupole lenses for spin-$\frac{1}{2}$ particles,
in: *Proceedings of the 15th Advanced ICFA Beam Dynamics Workshop on Quantum Aspects of Beam Physics*, (04-09 January 1998, Monterey, California USA),
Editor: Pisin Chen, (World Scientific, Singapore, 1999), pp. 682-694 (1999).
7. Sameen A. Khan,
Quantum aspects of accelerator optics,
in: Proceedings of the *1999 Particle Accelerator Conference* (**PAC99**),
(29 March - 02 April 1999, New York City, NY), *Editors*: A. Luccio and W. MacKay,
(IEEE Catalogue Number: 99CH36366) pp. 2817-2819 (1999).
8. Sameen A. Khan and Modesto Pusterla,
Quantum mechanical aspects of the halo puzzle,
in: Proceedings of the *1999 Particle Accelerator Conference* (**PAC99**)
(29 March - 02 April 1999, New York City, NY), *Editors*: A. Luccio and W. MacKay,
(IEEE Catalogue Number: 99CH36366) pp. 3280-3281 (1999).
9. Sameen A. Khan and Modesto Pusterla,
Quantum-like approaches to the beam halo problem,
in: Proceedings of the *6th International Conference on Squeezed States and Uncertainty Relations* **ICSSUR'99**, (24-29 May 1999, Napoli, Italy)
Editors: D Han, Y S Kim, and S Solimeno,
(NASA Conference Publication Series, 2000-209899) pp. 438-441 (July 2000).
10. S. A. Khan,
Quantum mechanical formalism of particle beam optics,
in: *Proceedings of the 18th Advanced ICFA Beam Dynamics Workshop on Quantum Aspects of Beam Physics* (15-20 October 2000, Capri, Italy), *Editor*: Pisin Chen,
(World Scientific, Singapore, May 2002), pp. 517-526 (2002).
11. Sameen Ahmed Khan,
Analogies between light optics and charged-particle optics,
ICFA Beam Dynamics Newsletter, **27**, pp. 42-48 (June 2002).
Cited in:
The NET Advance of Physics (Review Articles and Tutorials in an Encyclopaedic Format)
http://web.mit.edu/redingtn/www/netadv/Xoptics.html

E. Expository Publications

1. Sameen Ahmed Khan,
The World of Synchrotrons,
Resonance Journal of Science Education, **6**(11), pp. 77-84 (November 2001).
(Monthly Publication of the Indian Academy of Sciences (**IAS**), Copublished with Springer);
Larger Version as *E-Print arXiv*: http://arXiv.org/abs/physics/0112086/.
Cited in:
The Net Advance of Physics (Review Articles and Tutorials in an Encyclopaedic Format), at http://web.mit.edu/redingtn/www/netadv/Xsynchrotr.html

2. Sameen Ahmed Khan,
Introduction to Synchrotron Radiation,
Bulletin of the IAPT, **19**(5), pp. 149-153 (May 2002).
(**IAPT**: Indian Association of Physics Teachers).

3. Sameen Ahmed Khan,
Electron Beams for Radiation,
Kiran, **13**(3), 40-42 (July 2002).
(**Kiran**: the Bulletin of the Indian Laser Association).

4. Azher Majid Siddiqui and Sameen Ahmed Khan,
Ion Beam Channeling and Accelerator Programmes in India,
MRSI Newsletter, Vol. **B 02**, Number 4, pp. 3-5 (October 2002).
(**MRSI**: Materials Research Society of India).

5. Fathiya Khamis Al Rawahi, Sameen Ahmed Khan and Abdul Huq,
Microsoft Excel in the Mathematics Classroom: A Case Study,
in *Proceedings* of **The Second Annual Conference for Middle East Teachers of Mathematics, Science and Computing** (**METSMaC 2006**),
The Petroleum Institute, Abu Dhabi, United Arab Emirates, 14-16 March 2006.
Editors: Seán M. Stewart, Janet E. Olearski and Douglas Thompson, pp. 131-134 (2006).

6. Sameen Ahmed Khan,
Microsoft Excel in the Physics Classroom,
in *Proceedings* of **The Third Annual Conference for Middle East Teachers of Mathematics, Science and Computing** (**METSMaC 2007**),
The Petroleum Institute, Abu Dhabi, United Arab Emirates, 17-19 March 2007.
Editors: Seán M. Stewart, Janet E. Olearski, Peter Rodgers, Douglas Thompson and Emer A. Hayes, pp. 171-175 (2007).

7. Sameen Ahmed Khan,
Data Analysis Using Microsoft Excel in the Physics Laboratory,
Bulletin of the IAPT, **24**(6), pp. 184-186 (June 2007).
(**IAPT**: Indian Association of Physics Teachers).

8. Sameen Ahmed Khan,
Cylindro-Spherometer,
Bulletin of the IAPT, **26**(1), pp. 4-6 (January 2009).
(**IAPT**: Indian Association of Physics Teachers).

9. Sameen Ahmed Khan,
Spherometer and Cylindrometer, (*communicated*).
The article discusses the traditional spherometer and some variants such as the ring spherometer and the cylindrometer (also known as Cylindro-Spherometer), fabricated by the author.

10. Sameen Ahmed Khan,
Quadratic Surfaces.
(*in preparation*).

11. Sameen Ahmed Khan,
Coordinate Geometric Approach to.
(*in preparation*).

12. Azher Majid Siddiqui and Sameen Ahmed Khan,
Introduction to Ion Beam Channeling,
(*in preparation*).

13. Azher Majid Siddiqui and Sameen Ahmed Khan,
Accelerator-Based Techniques and Applications in Research and Industry,
(*in preparation*).

14. Sameen Ahmed Khan,
Doing Numerical Calculus using Microsoft EXCEL.
(*in preparation*).

15. Sameen Ahmed Khan,
Numerical Techniques using Microsoft EXCEL.
(*in preparation*).

16. ..., Sameen Ahmed Khan, ...,
Numerical Methods with Microsoft Excel.
(*in preparation*).

F. Articles in Preparation

- Sameen Ahmed Khan,
  Quantum Methodologies in Light Beam Optics.
- Sameen Ahmed Khan,
  Generalized Spherometer.
- Sameen Ahmed Khan,
  On the Linearization of Wave Equations.
- Sameen Ahmed Khan,
  Why is the Foldy-Wouthuysen transform so little known in optics?.
- R. Jagannathan *et al*,
  Maxwell Optics: IV. Polarization.
- Sameen Ahmed Khan and Kurt Bernardo Wolf,
  Equivalent and nonequivalent astigmatic Hamiltonians.
- R. Jagannathan, S. A. Khan and R. Simon,
  On the Maxwell optics of quasiparaxial beams.
- M. Conte, R. Jagannathan, S. A. Khan and M. Pusterla,
  A quantum mechanical formalism for studying the transport of Dirac-particle beams through magnetic optical elements in accelerators.
- S. A. Khan,
  Anomalous moments $\cdots$ **Thomas-BMT** $\cdots$.
- S. A. Khan and R. Jagannathan,
  Quantum theory of aberrations in charged-particle beam optics.
- Sameen A. Khan and Modesto Pusterla,
  A diffraction model for the beam halo problem.
- And Others...