BIO-DATA of Prof. B.S. Sandhu

1. **Name** : **Dr. B.S. Sandhu**

2. **Designation** : **Dean Academic Affairs, Dean (Faculty of Physical Sciences), Professor & Head, University Fellow, Member Syndicate, Coordinator UGC SAP CAS-II, and President-Indian Society for Radiation Physics**

3. **Department** : **Physics**

4. **Date of Birth** : 24-02-1962

5. **Address for correspondence** : **Department of Physics,**
Punjabi University,
Patiala-147002, India

Mobile : +91-98728 09265
E-mail : balvir@pbi.ac.in
balvirss99@yahoo.com
president@isrp.in

6. **Areas of Specialization** : **Experimental Nuclear Radiation Physics**

7. **Academic Qualifications**

S. No.	Degree Held	Year	Board/Univ./Inst.	% of marks	Div./ Rank	Subjects taken
1.	Matric	1978	P.S.Ed.B. CHD	74.08%	First	English, Punjabi, Hindi, Math., Science, Social Study, Drawing, Physical Ed.
2.	B.Sc.	1982	Pbi. Univ. Patiala	78.77%	First	Non-medical
3.	M.Sc.	1984	Pbi. Univ. Patiala	78.12%	First	Physics
4.	M.Phil.	1985	Pbi. Univ. Patiala	GPA =5.043	A-grade	Physics
5.	Ph.D.	1989	Pbi. Univ. Patiala			
6.	i) Qualified NET Examination held by UGC in 1984 ii) Qualified GATE Examination held by IIT in 1984					

8. Membership of Professional Bodies/Organizations

i) **President**, **National Executive of ISRP** (Dec 2012 onward)
ii) Life Member, Indian Society for Radiation Physics (**ISRP**)
iii) Life Member, Indian Society for Atomic and Molecular Physics (**ISAMP**)

9. Medals/Awards/Honours/Received

i) **College's Academic Roll of Honour** for Ist position in order of Merit in Punjabi University **B.Sc.- II (1981)** and **B.Sc.- III(1982)** Examinations.

ii) **University Medal for** First position in order of merit in Punjabi University in **B.Sc. Examination (1982)**

iii) **University Medal for** First position in order of merit in Punjabi University in **M.Sc. (1984).**

iv) **Chancellor's Medal for excellence** (1985) by Punjabi University, Patiala, for setting new academic record in University Examination.

10. Scholarships

i) Merit scholarship from 1978-85

ii) Research Fellow in the form of JRF & SRF from 1985-88

11. Details of Experience

S. No.	Name of the Institution	Position Held	Duration	Major job responsibilities & Nature of experience
1.	**Govt. College, Sunam (Pb.)**	**Lecturer**	1988-90	Teaching & Head, Physics Dept.
2.	**Punjabi University, Patiala**	**Lecturer**	1990-98	Teaching & Research
3.	**Punjabi University, Patiala**	**Reader**	1998-2006	Teaching & Research
4.	**Punjabi University, Patiala**	**Professor**	2006- 2013	Teaching & Research
5.	**Punjabi University, Patiala**	**Professor & Head, UGC SAP CAS - I Coordinator**	July 2014 - June 2017	Headship , Teaching, Research, & CAS Coordinator
6.	**Punjabi University, Patiala**	**Professor & UGC SAP CAS - II Coordinator**	April 2018 Onward	Teaching, Research, & CAS Coordinator
		Dean (Faculty of Physical Sciences) & Univ. Fellow	January 2020 Onward	Administrative duties for Research & Teaching in Physical Sciences
		Professor & Head, UGC SAP CAS -II Coordinator	July 2020 Onward	Administration of Physics, Teaching, Research, and CAS Coordinator
		Dean Academic	May 11, 2021	Administrative duties as Dean Academic

		Affairs		Affairs

12. Published Work (Please specify numbers only)

a.	Research Papers (Published)	1. International Journals 2. National 3. Invited Talks (Published) 4. In Books	= = = =	79 26 04 02
b.	Conference/Seminar/ Presentation	1. Full manuscript 2. Abstracts	= =	36 46

13. R & D Projects

a.	**UGC Major Research Projects** 1. Coordinator CAS (Center of Advanced Study) Phase-II 2. Coordinator CAS (Center of Advanced Study) Phase-I 3. Investigations of spectral distribution of Compton scattered gamma rays from bound electrons 4. Investigations of double-photon Compton scattering using a single gamma ray detector	 In Progress Completed Completed Completed
b.	**UGC Minor Research Projects** 1. Experimental Investigations of partial differential cross-sections in double photon Compton scattering	 Completed

14. Invited Talks/Articles

Abroad

1. A new non-destructive technique employing multiple scattering of photons for measurement of effective atomic numbers of composite materials, *ANS Joint Topical Meeting*, RPSD, IRD, BMD 2010 USA

2. Measurements of singly differential collision cross-sections of double-photon Compton scattering of 662 keV gamma photons, *ANS Joint Topical Meeting*, RPSD, IRD, BMD 2010 USA

3. Experimental observation of energy dependence of parameters characterizing multiply backscattering of gamma photons, *ANS Joint Topical Meeting*, RPSD, IRD, BMD 2010 USA

4. Non-destructive techniques for assigning effective atomic number to composite materials, Las Vegas, Nevada, USA

5. Investigations of multiple backscattering of gamma photons, Las Vegas, Nevada, USA

In India

1. Nuclear Radiations: Origin & Energy Spectra
2. Sources of Background & Shielding
3. Nuclear Radiation Detectors
4. Energy & Intensity Distribution in Double Photon Compton Scattering (NCAMP-15, Vishva Bharati)
5. Constituents of Matter
6. Albert Einstein- Great Physicist of 20^{th} century
7. Investigations of multiple scattering of gamma rays
8. Non-destructive techniques for assigning effective atomic number to composite materials, RRCAT, Indore
9. Investigations of multiple backscattering of gamma photons, M. L. Sukhadia University, Udaipur (Rajasathan)
10. Experimental investigations of Compton scattering for non-destructive tomographic measurements for defect detection
11. National Symposium on Radiation Physics & Nanomaterials (NSRPN-11), Punjabi University, Patiala (Punjab)
12. Incoherent scattering of gamma radiations for non-destructive tomographic inspection for defect detection
13. 2^{nd} DAE-BRNS Symposium on Atomic, Molecular & Optical Physics, Karnataka University, Dharwad (Karnataka)
14. Applications of scattering of gamma photons in Tomography, Industry, medical and landmine detection
15. 2^{nd} National Conference on Advanced Materials and Radiation Physics, Sant Longowal Institute of Engg. & Tech, Longowal (Punjab)
16. Rayleigh and Compton scattering techniques for medical applications and landmine detection
17. 3^{rd} International Conference on Current Developments in Atomic, Molecular, Optical and Nano Physics with Applications, Delhi University, Delhi
18. Radiation Applications in Industry, NSRP-19, Mamallapuram (Tamilnadu).
19. Scattering of gamma and X-ray photons for medical applications and detection of landmines, ECPAMP-2013, Vallabh Vidyanagar (Gujarat)
20. Non-destructive techniques for assigning effective atomic number (Z_{eff}) to composites and role of Zeff in detection of explosives and biological weapons, AMRP-2013, SLIET, Longowal (Punjab)
21. Nuclear Radiation and Applications, Seminar on Nuclear Radiation and Applications (NRA-2014), Punjabi University, Patiala
22. Key note address: Nuclear Radiation and Applications, National Physics Conference (NPC-01) Khalsa College, Patiala, October 30, 2014.

23. 4th National Conference on Advanced Materials and Radiation Physics, Sant Longowal Institute of Engg. & Tech, Longowal (March 13-14, 2015).

24. Seminar on Recent Advances in Accelerators and Detector Technology for Nuclear Physics, Panjab University, Chandigarh (March 20, 2015).

25. National conference on Physics Industry Interface (NCPII-2015), Kurukshetra University, Kurukshetra (Sept 2-4, 2015).

26. 20th National Symposium on Radiation Physics, Mangalore University, Mangalagangthri, Karnataka (Oct 28-30, 2015).

27. National Seminar on New Frontiers in Physics, G.M.N. College, Ambala (Haryana) March 2-3, 2016.

28. National Conference on Current Development in Physics (CDIP-2016), S.D. (PG) College, Panipat (Haryana) March 28-29, 2016.

29. National Conference on Research Trends in Physics and Electronics (NPE-2016) S.G.G.S. Khalsa College, Mahilpur, District-Hoshiarpur, November 25-26, 2016.

30. 21th National Symposium on Radiation Physics, Raja Rammana Centre for Advanced Technology (RRCAT) Indore (M.P.) (March 05-07, 2018)

31. Key note address: National Seminar on Emerging Research Trends in Experimental Physics, Guru Nanak College for Girls, Sri Muktsar Sahib (Punjab) February 22, 2019

32. National Seminar on Societal and Medical Applications of Nuclear Radiation Physics Department, Punjabi University, Patiala (Punjab) March 15, 2019

33. International Conference on Trends in Science, Engineering and Management (ICTSEM-2019), Gulzar Group of Institutions (GGI) Khanna (Ludhiana) July 13, 2019

34. International Conference on Advanced Nanomaterials for Energy Engineering, Biological and Medical Applications - ICAN 2019, Chettinad College of Engineering and Technology, Karur. (TN) December 12-13, 2019

35. 5th National e-Conference on Advanced Materials and Radiation Physics (AMRP-2020) Sant Longowal Institute of Engg. & Tech, Longowal (November 9-11, 2020)

15. Ph.D. students guided/under guidance (Details)

S. No.	Name of the student	Title of thesis	Year of completion
1.	Manju Bala Saddi	Investigation of double photon Compton scattering using single gamma detector	2002
2.	Manpreet Singh	Experimental investigation of multiply Compton scattered gamma rays in various materials	2007
3.	Gurvinderjit Singh	Experimental investigation of saturation depth of 662 keV gamma rays in different materials	2007
4.	Arvind Deepak Sabharwal	Investigations of multiply Compton backscattering of gamma rays	2010
5.	Mohinder Pal Singh	An experimental study of Rayleigh to	2011

		Compton scattering cross-section ratio for elemental analysis	
6.	Amandeep Sharma	Study of absorption and scattering tomographic gamma ray technique for non-destructive testing	2011
7.	Akash Tandon	Study of Industrial and Medical samples using Gamma rays as Non-destructive tool	2020
8.	Mohinder Singh	Material Characterization using Gamma ray Transmission and Scattering Techniques	2020
9.	Rupinder Kaur	Investigations of decay modes of nuclear systems within statistical and Dynamical approaches	2021

16. M.Phil./M.Tech. students guided

S. No.	Name of the student	Title of thesis	Year of completion
1.	Aarti Sharma	Double-photon Compton scattering	2002
2.	Gulshan Dutta	Intensity measurements in two-photon Compton scattering	2003

17. List of papers/courses taught at P.G. and U.G. level

Class		Paper(s) Taught
Ph. D. (Course work)	1.	Techniques in Experimental Radiation Physics
M.Phil. (Physics)	1. 2.	Advanced Solid State Physics Techniques in Experimental Radiation Physics
M.Sc. (Physics)	1. 2. 3. 4. 5. 6. 7.	Classical Mechanics Nuclear Physics Electronics Radiation Physics Mathematical Physics Quantum Mechanics FORTRAN Programming
M.Sc. (Chemistry)	1.	Basic Course in Electronics
Post B.Sc. Diploma in Electronics	1.	Digital Electronics
U.G. Classes	1.	Physics (Senior Secondary Class – I & II)

Laboratory	1.	M.Sc. Physics (Previous and Final)
	2.	M.Sc. Applied Physics (Previous and Final)
	3.	M.Sc. Chemistry (Electronics Lab)
	4.	Senior Secondary Class –I & II

18. Technical Proficiency

Competent to handle strong radioactive sources, Nuclear Radiation Detectors, Nuclear Modules and counting systems including multiple channel analyzer, Electronic equipments, Radiation dosimetry, Analysis of nuclear spectroscopic data, Design and Fabrication of various experiments relating to nuclear radiation having applications in Tomography, Medical physics, pipe line inspection, landmine detection, interface detection, Nuclear spectroscopy of gamma radiation etc., Double photon Compton scattering and multiple scattering of gamma rays.

19. List of Publications of *Dr. B. S. Sandhu*

a) PAPERS PUBLISHED IN INTERNATIONAL JOURNALS

79. Investigations of various gamma radiation interaction parameters of human tissues and their tissue substitute materials for dosimetric applications
Inderjeet Singh, Rohit, Bhajan Singh, **B.S. Sandhu** and Arvind D. Sabharwal
Rad. Phys. & Chem. **189** (2021) 109742

78. Thickness measurements by using Back-Scattering of Gamma Photons
Rohit, Inderjeet Singh, Bhajan Singh, **B S Sandhu**, and Arvind D. Sabharwal
AIP Conference Proceedings **2352** (2021) 050045 (1- 5)

77. Albedo factor for Tissue Equivalent Material Using Multiple Backscattering of Gamma Photons
Inderjeet Singh, **B S Sandhu**, Bhajan Singh, Rohit and Arvind D. Sabharwal
AIP Conference Proceedings **2352** (2021) 050038 (1- 4)

76. A Compton scattering technique for wood characteristics using FLUKA Monte Carlo code
Amandeep Sharma, Bhajan Singh, **B.S. Sandhu**
Rad. Phys. & Chem. **182** (2021) 1093649 (1-11)

75. Comparative Study for Intermediate Crystal Size of NaI(Tl) Scintillation detector
Inderjeet Singh, Rohit, Bhajan Singh, **B. S Sandhu**, Arvind D Sabharwal
Rev. Sci. Instr. **91** (2020) 073105 (1-10)

74. Dynamical aspects of $^{48}Ti+^{58}Fe$, $^{58}Ni \rightarrow ^{106}Cd^*$, $^{106}Sn^*$ reactions at energies around the Coulomb barrier
Rupinder Kaur, Maninder Kaur, Varinderjit Singh, BirBikram Singh and **B.S. Sandhu**
Phys. Rev. C **101** (2020) 044605 (1-11)

73. Clustering effects in the exit channels of $^{12,13}C + ^{12}C$ reactions within collective clusterization mechanism of dynamical cluster decay model
Rupinder Kaur, Sarbjeet Kaur, , BirBikram Singh, **B.S. Sandhu** and S.K. Patra
Phys. Rev. C **101** (2020) 034614 (1-7)

72. Study of radiation interaction parameters for organic compounds at gamma photon energies different from available standard radioisotopes
Mohinder Singh, Akash Tondon, Bhajan Singh, **B. S. Sandhu**

Chinese Journal of Physics (Elsevier) **65** (2020) 221-234

71. Investigation of photon interaction parameters of Polymeric materials using Monte Carlo simulation
Amandeep Sharma, Bhajan Singh, **B. S. Sandhu**
Chinese Journal of Physics (Elsevier) **60** (2019) 709 –719

70. Effect of addition of cerium (III) nitrate hexahydrate on gamma ray interaction properties in acetone at various gamma energies obtained by Compton scattering technique
Mohinder Singh, Akash Tondon, Bhajan Singh, **B. S. Sandhu**
Chemical Physics **525** (2019) 110377

69. Importance of voxel size in localizing defect using gamma ray scattering
Akash Tondon, Mohinder Singh, **B. S. Sandhu** and Bhajan Singh
Nuclr. Sci. & Engg. **193** (2019) 1265 –1275

68. Investigating the fusion enhancement for neutron-rich mid-mass nuclei using the dynamical cluster-decay model
Rupinder Kaur, M. Kaur, Varinderjit Singh, Sarbjeet Kaur, BirBikram Singh, **B.S. Sandhu**
Phys. Rev. C **98** (2018) 064612(1 - 10)

67. Experimental calculations of number, energy and dose albedos for various materials using 662 keV gamma rays
Inderjeet Singh, Arvind D. Sabharwal, Bhajan Singh and **B.S. Sandhu**
Radiation Effects & Defects in Solids **Vol. 173 No. 11-12** (2018) 944 – 955

66. Energy dependence of radiation interaction parameters of some organic compounds
Mohinder Singh, Akash Tondon, **B.S. Sandhu** and Bhajan Singh
Rad. Phys. & Chem. **145** (2018) 80 – 88

65. Determination of effective atomic number of biomedical samples using γ-ray back-scattering
Inderjeet Singh, Bhajan Singh, **B S Sandhu**, and Arvind D. Sabharwal
AIP Conference Proceedings **1953** (2018) 140134 (1- 4)

64. Molar extinction coefficient of organic compounds as a function of effective atomic number
Mohinder Singh, Akash Tondon, **B S Sandhu**, and Bhajan Singh
AIP Conference Proceedings **1953** (2018) 140129 (1- 4)

63. Evolvement of preformation probability of alpha cluster decay of parent nuclei $84 \leq Z \leq 92$ having N=126
Rupinder Kaur, Bir Bikram Singh, Mandeep Kaur, **B S Sandhu**, and Maninder Kaur
AIP Conference Proceedings **1953** (2018) 140102 (1- 4)

62. Nondestructive study of wood using the Compton scattering technique
Akash Tondon, Mohinder Singh, **B.S. Sandhu** and Bhajan Singh
Appl. Rad. and Isotopes **129** (2017) 204 – 210

61. A Gamma-ray scattering technique for estimation of density and moisture content of wood
Amandeep Sharma, Bhajan Singh, **B S Sandhu**
Radiation Effects & Defects in Solids **Vol. 172 No. 3-4** (2017) 286 - 295

60. Experimental Evaluation of Effective Atomic Number of Composite Materials Using Back-scattering of Gamma Photons
Inderjeet Singh, Bhajan Singh, **B S Sandhu,** Arvind D. Sabharwal
Radiation Effects & Defects in Solids **Vol. 172 No. 3-4** (2017) 204 - 215

59. A Compton scattering technique for concentration and fluid-fluid interface measurements using NaI(Tl) detector
Akash Tondon, Mohinder Singh, **B S Sandhu** and Bhajan Singh
Nucl. Instr. & Meth. B **403** (2017) 21-27

58. An Experimental Study of Energy Dependence of Saturation Thickness of Multiply Scattered Gamma Rays
Gurvinderjit Singh, **B S Sandhu** and Bhajan Singh
Asian Journal of Physical Sciences 1(1): 1-5, 2016

57. An experimental study of energy dependence of saturation thickness of multiply scattered gamma rays in binary alloys
Gurvinderjit Singh, Bhajan Singh and **B S Sandhu**
AIP Conference Proceedings **1675** (2015) 020051 (1- 4)

56. A Compton scattering technique to determine wood density and locating defects in it
Akash Tondon, Mohinder Singh, **B S Sandhu** and Bhajan Singh
AIP Conference Proceedings **1675** (2015) 020048 (1- 4)

55. Experimental evaluation of saturation thickness for 662 keV in Lead at scattering angle 120°.
Gurvinderjit Singh, **B S Sandhu** and Bhajan Singh
International Journal of Scientific & Engineering Research **6** (2015) 373 - 376

54. Measurement of effective atomic number and Rayleigh to Compton cross-section ratio for 145 keV gamma photons
M P Singh, Amandeep Sharma, Bhajan Singh & **B S Sandhu**
J Radioanal Nucl Chem **302** (2014) 187 - 194

53. Experimental measurement of Rayleigh to Compton cross-section ratio for 279 keV gamma photons
M P Singh, Amandeep Sharma, Bhajan Singh & **B S Sandhu**
International Journal of Engineering Research and Technology (IJERT)
AMRP-2013 Conference Proceedings: Pages 52-55.

52. A practical aspect of gamma-ray based Compton scatter densitometry
Amandeep Sharma, M P Singh, Bhajan Singh & **B S Sandhu**
International Journal of Engineering Research and Technology (IJERT)
AMRP-2013 Conference Proceedings: Pages 11-15.

51. An experimental study on cross-section ratio of coherent to incoherent scattering for 145 keV incident gamma photons
M P Singh, Amandeep Sharma, Bhajan Singh & **B.S. Sandhu**
Radiation Measurements **59** (2013) 30 - 36

50. A non-destructive scattering technique for investigation of pulmonary edema
Amandeep Sharma, Bhajan Singh and **B.S. Sandhu**
Appl. Rad. Isotopes **70** (2012) 112 - 118

49. A Gamma Ray Tomographic Densitometer System for the Investigation of Concrete Structures
Amandeep Sharma, **B.S. Sandhu** and Bhajan Singh
J. Korean Phys. Soc. **59** (2011) 2880 - 2883

48. Investigations of energy dependence of saturation thickness of multiply backscattered gamma photons in elements and alloys - an inverse matrix approach
Arvind D. Sabharwal, **B.S. Sandhu** and Bhajan Singh
Journal of Physics: Conference series **312** (2011) 052021(1 - 6)

47. Measurements of singly differential collision cross-sections of double-photon Compton scattering of 662 keV gamma photons
M. B. Saddi, Bhajan Singh and **B.S. Sandhu**
J. Nuclear Technology **175** (2011) 168 - 174

46. A new non-destructive technique employing multiple scattering of photons for measurement of effective atomic numbers of composite materials
B.S. Sandhu

J. Nuclear Technology **175** (2011) 118 - 123

45. Albedo factors of 279, 320, 511 and 662 keV backscattered gamma photons
Arvind D. Sabharwal, Surinder Singh, Bhajan Singh and **B.S. Sandhu**
Radiation Effects & Defects in Solids **166** (2011) 451 - 458

44. Multiple backscattering on monoelemental materials and albedo factors of 279, 320, 511 and 662 keV photons
Arvind D. Sabharwal, **B.S. Sandhu** and Bhajan Singh
Physica Scripta **83** (2011) 025303 (1 - 7)

43. Experimental response function of NaI(Tl) scintillation detector for gamma photons and tomographic measurements for defect detection
Amandeep Sharma, Karamjit Singh, Bhajan Singh and **B.S. Sandhu**
Nucl. Instr. & Meth. B **269** (2011) 247 - 256

42. Incoherent scattering of gamma photons for non-destructive tomographic inspection of pipeline
Amandeep Sharma, **B. S. Sandhu** and Bhajan Singh
Appl. Rad. Isotopes **68** (2010) 2181 - 2188

41. Non-destructive evaluation of scientific and biological samples by scattering of 145 keV gamma rays
M.P. Singh, Amandeep Sharma, Bhajan Singh and **B.S. Sandhu**
Radiation Measurements **45** (2010) 960 - 965

40. A non-destructive technique for assigning effective atomic-number to scientific samples by scattering of 59.54 keV gamma photons
M.P. Singh, Amandeep Sharma, Bhajan Singh, **B.S. Sandhu**
Nucl. Instr. & Meth. A **619** (2010) 63 - 66

39. Non-destructive evaluation of Pb-Sn alloys by scattering of 145 keV gamma rays
M.P. Singh, Amandeep Sharma, Bhajan Singh and **B.S. Sandhu**
Asian J. Chem. **21** (2009) S242 - 245

38. A gamma scattering technique for inspecting density variation
Amandeep Sharma, M.P. Singh, Bhajan Singh and **B.S. Sandhu**
Asian J. Chem. **21** (2009) S301 - 304

37. Investigations of energy dependence of saturation thickness of multiply backscattered gamma photons in carbon
Arvind D. Sabharwal, Bhajan Singh and **B.S. Sandhu**
Asian J. Chem. **21** (2009) S237 - 241

36. Investigations of effect of target thickness and detector collimation on 662 keV multiply backscattered gamma photons
Arvind D. Sabharwal, **B.S. Sandhu** and Bhajan Singh
Radiation Measurements **44** (2009) 411 - 414

35. Investigations of multiple scattering of 320 keV gamma rays; a new technique to assign effective atomic number to composite material
Manpreet Singh, Bhajan Singh and **B.S. Sandhu**
Physica Scripta **79** (2009) 035101 (1 - 8)

34. Investigations of multiple backscattering and albedos of 1.12 MeV gamma photons in elements and alloys
Arvind D. Sabharwal, Bhajan Singh and **B.S. Sandhu**
Nucl. Instr. & Meth. B **267** (2009) 151 - 156

33. Response function of NaI(Tl) detector and multiple backscattering of gamma rays in aluminium
Arvind D. Sabharwal, Manpreet Singh, Bhajan Singh and **B.S. Sandhu**

Appl. Rad. Isotopes **66** (2008) 1467 - 1473

32. Experimental observation of energy dependence of saturation thickness of multiply scattered gamma photons
Manpreet Singh, Gurvinderjit Singh, Bhajan Singh and **B. S. Sandhu**
Rad. Phys. & Chem. **77** (2008) 991 - 995

31. Measurement of collision integral cross-sections of double-photon Compton effect using a single gamma ray detector: A response matrix approach
M. B. Saddi, Bhajan Singh and **B. S. Sandhu**
Nucl. Instr. & Meth. B **266** (2008) 3309 - 3318

30. Experimental investigations of multiple scattering of 662 keV gamma photons in elements and binary alloys
Gurvinderjit Singh, Manpreet Singh, **B.S. Sandhu** and Bhajan Singh
Appl. Rad. Isotopes **66** (2008) 1151 - 1159

29. Measurement of effective atomic number of composite materials using Rayleigh to Compton scattering of 279 keV gamma rays
M.P. Singh, **B.S. Sandhu** and Bhajan Singh
Physica Scripta **76** (2007) 281 - 286

28. Energy and intensity distributions of 0.279 MeV multiply Compton scattered photons in soldering material
Manpreet Singh, Gurvinderjit Singh, Bhajan Singh and **B.S. Sandhu**
Nucl. Instr. & Meth. A **580**(2007) 54 - 57

27. Measurement of effective atomic number of composite materials using scattering of gamma rays
M.P. Singh, **B.S. Sandhu** and Bhajan Singh
Nucl. Instr. & Meth. A **580** (2007) 50 - 53

26. Experimental investigation of multiple scattering of 662 keV gamma rays in zinc at 90°
Gurvinderjit Singh, Manpreet Singh, **B.S. Sandhu** and Bhajan Singh
Rad. Phys. & Chem. **76** (2007) 750 - 758

25. Angular distribution of 0.662 MeV multiply-Compton scattered gamma rays in copper
Manpreet Singh, Gurvinderjit Singh, **B.S. Sandhu** and Bhajan Singh
Radiation Measurements **42** (2007) 420 - 427

24. Measurement of doubly differential collision cross-sections for double-photon Compton scattering of 0.662 MeV gamma rays
Gulshan Datta, M. B. Saddi, B. Singh and **B.S. Sandhu**
Radiation Measurements **42** (2007) 256 - 262

23. Compton backscattering from broad beam of gamma rays in Al and Zn
Arvind D. Sabharwal, **B.S. Sandhu** and Bhajan Singh
Asian J. Chem. **18** (2006) 3390 - 3394

22. Measurement of saturation depth of 279 keV gamma rays in bronze
Manpreet Singh, Gurvinderjit Singh, **B.S. Sandhu** and Bhajan Singh
Asian J. Chem. **18** (2006) 3292- 3294

21. Determination of effective atomic number using Rayleigh to Compton scattering of gamma rays
M.P. Singh, **B.S. Sandhu** and Bhajan Singh
Asian J. Chem. **18** (2006) 3275 - 3278

20. Energy and intensity distributions of multiple Compton scattering of 0.279-, 0.662-, and 1.12-MeV γ-rays
Manpreet Singh, Gurvinderjit Singh, Bhajan Singh and **B.S. Sandhu**

Phys. Rev. A **74** (2006) 042714 (1 - 9)

19. Experimental observation of Z-dependence of saturation depth of 0.662 MeV multiply scattered gamma rays
Gurvinderjit Singh, Manpreet Singh, Bhajan Singh and **B.S. Sandhu**
Nucl. Instr. & Meth. B **251** (2006) 73 - 78

18. A successful experimental observation of double-photon Compton scattering of gamma rays using a single gamma detector
M. B. Saddi, **B. S. Sandhu** and B. Singh
Ann. Nucl. Energy **33** (2006) 271 - 280

17. Effect of detector collimator and sample thickness on 0.662 MeV multiply Compton-scattered gamma rays
Manpreet Singh, Gurvinderjit Singh, **B.S. Sandhu** and Bhajan Singh
Appl. Rad. Isotopes **64** (2006) 373 - 378

16. Collision, scattering and absorption differential cross-sections in double-photon Compton scattering
R. Dewan, M.B. Saddi, **B.S. Sandhu**, B. Singh and B.S. Ghumman
Ann. Nucl. Energy **32** (2005) 1008 - 1022

15. Collision integral cross-sections in double photon Compton scattering and a possible method for their measurement
Aarti Sharma, M.B. Saddi, B. Singh and **B.S. Sandhu**
Nuclr. Sci. & Engg. **148** (2004) 445 - 452

14. Collision integral cross section measurements in two-photon Compton scattering
R. Dewan, M.B. Saddi, **B.S. Sandhu**, B. Singh and B.S. Ghumman
Acta Physica Polonica B **35** (2004) 859- 869

13. Experimental study of energy distribution in double photon Compton scattering
R. Dewan, M.B. Saddi, **B.S. Sandhu**, B. Singh and B.S. Ghumman
Nuclr. Sci. & Engg. **141** (2002) 165 -170

12. Experimental investigations of angular dependence of scattering and absorption cross sections in double photon Compton scattering
B.S. Sandhu, M.B. Saddi, B. Singh and B.S. Ghumman
J. Phys. Soc. Jpn. **70** (2001) 947 - 953

11. Experimental study of angular dependence in double-photon Compton scattering
B.S. Sandhu, R. Dewan, M.B. Saddi, B. Singh and B.S. Ghumman
Nucl. Instr. & Meth. B **168** (2000) 329 - 336

10. Measurement of two-photon Compton cross sections
B.S. Sandhu, R. Dewan, B. Singh and B.S. Ghumman
Phys. Rev. A **60** (1999) 4600 - 4605

9. Investigations of angular distributions of collision products in double-photon Compton scattering
R. Dewan, J. Kaur, **B.S. Sandhu**, B. Singh and B.S. Ghumman
Rad. Phys. & Chem. **51** (1998) 389

8. Investigation of spectral distribution of Compton scattered gamma rays from K-shell electrons of Tin using 662 keV incident photons
J. Kaur, R. Dewan, **B.S. Sandhu**, B. Singh and B.S. Ghumman
Rad. Phys. & Chem. **51** (1998) 377

7. Absolute differential cross sections for double-photon Compton scattering
B.S. Sandhu, B. Singh and B.S. Ghumman
Can. J. Phys. **74** (1996) 692 - 696

6. Investigations of angular distribution in two-photon Compton scattering
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