

Dr. Shailendra Satish Dahiwale

Assistant Professor

Department of Physics,
University of Pune,
Ganeshkhind,
Pune - 411007.

E mail: ssd-at-physics.unipune.ac.in
shailsd-at-gmail.com

Phone: +918108001200

Corresponding Address:

Hazari Pahad,
Vayusena Nagar,
Nagpur-411007,
Maharashtra (INDIA).

Educational Qualification:

- 1) **Ph.D (Physics)** Dept. of Physics, University of Pune, 2009
- 2) **M.Sc. (Physics)** Dept. of Physics, University of Pune, 2002.
- 3) **B.Sc (Physics)**, Nagpur University, Maharashtra, 2000.

Ph. D topic:

Studies on Radiation Induced Effects on (i) Minority carrier lifetime in c-Si and (ii) Hot carrier injection and Single Event Upset in MOS memory devices.

Research Interest:

- 1) Radiation damage in materials
- 2) Accelerator Physics
- 3) Metal Insulator Semiconductor structures for high k and photovoltaic applications
- 4) Thin Film Solar Cells
- 5) Effect of radiations on state of art devices and its mitigation.

Publications:

International Journals

1. Effect of texturing process involving saw-damage etching on crystalline silicon solar cells, Hyunho Kim, Sungeun Park, Byungjun Kang, Seongtak Kim, Sung Ju Tark, Donghwan Kim, **S.S. Dahiwale**, **Applied Surface Science** **284 (2013) 133**.
2. Influence of SiNx:H film properties according to gas mixture ratios for Crystalline Silicon Solar Cells, Kyung Dong Lee, **S. S. Dahiwale**, Young Do Kim, Sungeun Park, SungJu Tark, Dinghwan Kim, **Current Applied Physics** **13 (2013) 241-245**.
3. A study on optimization of SiNx:H films for crystalline silicon solar cells, Kyung Dong Lee, Young Do Kim, **Shailendra Dahiwale**, Hyunpil Boo, Sungeun Park, Sung Ju Tark and Donghwan Kim, **Journal of Korean Vacuum Society** **21(1), 2012, 29-35**.
4. Influence of gas mixture ratios on properties of SiNx:H films for Crystalline Silicon Solar Cells, Kyung Dong Lee, **S. S. Dahiwale**, Young Do Kim, Sungeun Park, SungJu Tark, Dinghwan Kim, **Energy Procedia** **27 (2012) 419-425**.

5. Irradiation effects of 6 MeV electron on electrical properties of Al/Al₂O₃/n-Si MOS capacitors, P. Laha, I. Banerjee, A. Bajaj, P. Chakraborty, P.K. Barhai, **S.S. Dahiwale**, A.K. Das, V.N. Boraskar, D. Kim, S.K. Mahapatra, **Radiation Physics and Chemistry** **81** (2012) **1600-1605**.
6. 6 MeV electron irradiation effects on electrical properties of Al/TiO₂/n-Si MOS capacitors, P. Laha, **S.S. Dahiwale**, I. Banerjee, S.K. Pabi, D. Kim, P.K. Barhai, V.N. Boraskar, S.K. Mahapatra, **Nuclear Instruments and Methods B** **269** (2011) **2740-2744**.
7. Effect of leakage current & dielectric constant on single & double layer oxides in MOS structure", P. Laha, A. B. Panda, **S. S. Dahiwale**, K. Date, K. R. Patil, P. K. Barhai, A. K. Das, I. Banerjee, S. K. Mahapatra, **Thin Solid Films**, **519** (2010) **1530-1535**.
8. Swift heavy ion induced single event upsets in high density UV-EPROM's **S. S. Dahiwale**, N.S.Shinde, D. Kanjilal, V. N. Boraskar, S. D. Dhole **Nuclear Instruments and Methods B** **266** (2008) **1729-1733**.
9. Depth distribution of carrier lifetime in 65MeV energy oxygen ion irradiated silicon. N.S.Shinde, **S.S.Dahiwale**, D. Kanjilal, V.N.Bhoraskar, S.D.Dhole **Nuclear Instruments and Methods –B** **244** (2006) **161-165**.
10. Damage Induced by high energy multiply charged oxygen ions in oxide coated silicon. S.D.Dhole, **S.S.Dahiwale**, V.R.Kulkarni, K.A.Bogle, N.S.Shinde, V.N.Bhoraskar, **Nuclear Instruments and Methods –B** **244** (2006) **354-358**.
11. Simple one-pot synthesis of noble metal nanoparticle/ZnO nanorod nanocomposites and their photocatalytic application, Hyunju Lee, Sungwon Kim, **Shailendra Dahiwale**, Tae-Yeon Seong, Jeunghee Park, Donghwan Kim, **Current Applied Physics** (2010) [*communicated*]
12. Surface profile of minority carrier lifetime in 65 and 100 MeV fluorine irradiated n- Si(111) **S. S. Dahiwale**, N. S. Shinde, V. N. Boraskar and S. D. Dhole **Nuclear Instruments and Methods** (2010). [*communicated*]
13. Investigation of interdiffusion effect of silicon based Al₂O₃/TiO₂ heterostructure on bulk potential and interface trap density, Pinaki Laha, **S. S. Dahiwale**, Biswajit Saha, Purushottam Chakraborty, Donghwan Kim, P K Barhai, A K Das, I Banerjee and S K Mahapatra, **Journal of Physics D** [*communicated*]

National/International conference journals/proceedings

14. Influence of gas mixture ratio on properties of SiNx:H films for crystalline silicon solar cells, K.D. Lee, **S. S. Dahiwale**, Y.D. Kim, S. Kim, J. Lee, S. Park, S.J. Tark, and Donghwan Kim, 2nd International Conference on crystalline Silicon Photovoltaics, Luven, Belgium, April 3-5, 2012.
15. Effect of N₂O on annealed and un-annealed Al₂O₃ films prepared by Plasma Assisted Atomic Layer Deposition, **S. S. Dahiwale**, Kyung Dong Lee, Young Do Kim, Sung Ju Tark, Sungeun Park, and Donghwan Kim, Technical Digest of 21st International Photovoltaic Science and Engineering Conference, Hilton, Fukoka Sea Hawk 28th Nov. – 2nd Dec. 2011.
16. Fixed Charge Effect of SiNx Film on Efficiency of Crystalline Silicon Solar Cells, K. D. Lee, Y. D. Kim, **S. S. Dahiwale**, S. J. Tark, J.-H. Lee, S. Park, S. Kim, S. Bae and D. Kim, Technical Digest of 21st International Photovoltaic Science and Engineering Conference, Hilton, Fukoka Sea Hawk 28th Nov. – 2nd Dec. 2011.

17. PECVD SiNx for crystalline silicon solar cells, Kyung Dong Lee, Young Do Kim, **S. S. Dahiwale**, Sung Ju Tark, Kong-Han Lee, Sungeun Park, Donghwan Kim, 14th Joint Symposium on Electronic Materials, Seoul, S. Korea, August 18-21, 2011.
18. 6 MeV electron beam induced diffusion of iodine in isotactic polypropylene, N. L. Mathakari, B. J. Patil, **S. S. Dahiwale**, V. N. Bhoraskar, and S. D. Dhole, Proc. SPIE 8144, 81440J, 2011.
19. Effect of high energy electron bombardment on iodine and lithium penetration into PEEK, HDPE and PI, J. Vacik, V. Lavrentiev, **S. S. Dahiwale**, V. N. bhoraskar, V. Hnatowicz, K. Narumi, 10th European conference on Accelerators in Applied Research and Technology, Athens, Greece; 2010.
20. Single Event Effects on Highly Packed Memory Devices by Heavy Ion Irradiation **S.S.Dahiwale**, V. N. Bhoraskar, S. D. Dhole, Proceedings of D.A.E., Solid State Physics Symposium, vol. 51 (2006) 347-348.
21. Proposed Pulsed Neutron Source for Radiotherapy and Radiography. B. J. Patil, **S. S. Dahiwale**, S. T. Chavan, S. N. Pethe, V. F. Khan, R. Krishnan, V. N. Bhoraskar and S. D. Dhole, Journal of Medical physics Vol. 32 (2007) |Suppl|, s38.
22. Effect of 15 keV Energy Electrons on the Lifetime of Minority Carriers in n-Si and SiO₂ Substrate. G.J.Tambave, **S.S.Dahiwale**, K.A.Bogle, S.K.Mahapatra, V.N.Bhoraskar and S.D.Dhole, Proceedings of D.A.E., Solid State Physics Symposium, vol. 51 (2006) 761-762.
23. Comparison of minority carrier lifetime in MeV energy electrons, gamma rays and thermal neutrons irradiated crystalline silicon. G.S.George, **S.S.Dahiwale**, J.E.Yewale, V.N.Bhoraskar and S.D.Dhole Proceedings of D.A.E., Solid State Physics Symposium, vol. 49 (2004) 673-674.

Awards:

1. UGC-Dr. D. S. Kothari Post Doctoral Fellowship, June 2012.
2. Brain Korea 21 (BK21) Fellowship (April-2010 to May-2012), Republic of Korea.
3. UGC-Dr. D. S. Kothari Post Doctoral Fellowship, June 2010.
4. Research Associate (October 2009-March 2010), ISRO-UoP STC, Pune
5. Junior Research Fellow (Aug. 2007 to Sept. 2010), ISRO-UoP STC, Pune.
6. Project Assistant (Jan 2007 to July 2007), ISRO-UoP STC, Pune.
7. Project Assistant (May 2005 to Dec 2006), SAMEER IIT Powai, India
8. Project Assistant (April 2003 to March 2005), Nuclear Science Center, New Delhi, India.

Scientific Activity:

1. Working as a **reviewer** for Journal of **Materials Science: Materials in Electronics** (JMSE), Springer
2. Lifetime Member: Indian Physics Association (Pune Chapter)
3. Lifetime Member: Indian Association of Physics Teacher

Research Skill:

I. Electrical Characterization Techniques

- Capacitance-Voltage (C-V)
- Current-Voltage (I-V).
- Incident current to photon convertor (ICPC).
- Four Probe Resistivity
- Hall Voltage

II. Instrumentation

- Field Programmable Gate Array (FPGA) based Measurement system for Single Event Upset study.
- Photoconductive decay (PCD) based Minority Carrier Lifetime measurement system.
- PC based measurement system for Hot carrier injection effect study.

III. Material Characterization Techniques

- Rutherford Backscattering (RBS)
- Elastic Recoil Detection (ERD)
- Secondary Ion Mass Spectroscopy (SIMS)
- Scanning Electron Microscopy and EDAX
- X-ray diffraction (XRD)
- UV-Visible Spectroscopy
- Atomic Force Microscopy (AFM)

IV. Instrumental handling experience:

- DC and RF Magnetron Systems
- Plasma Enhanced Chemical Vapor Deposition (PECVD)
- 6 MeV Race track Microtron
- 14 MeV Neutron Generator
- 2 eV-20 keV Low Energy Beam Facility

Softwares known:

- PCID (1D semiconductor simulation)
- SHRIM/TRIM (Heavy Ion Interaction with materials).
- Origin6.1, GNU plot.

Personal Details

Date of Birth: 13/11/1979
Marital Status: Married
Permanent Address: At: Hazari Pahad,
Vayusena nagar, Nagpur-7
Present Working Place: Department of Physics,
University of Pune,
Ganeshkhind,
Pune – 411007 (INDIA)

References:

- 1) Dr. S. D. Dhole,
Reader in Physics,
Department of Physics,
University of Pune,
Pune-411007
Maharashtra, India
e-mail: sanjay.at.physics.unipune.ac.in
- 2) Prof. V.N.Bhoraskar,
Visiting Professor,
D. I. A. T, Girinagar,
Pashan, Pune
Maharashtra, India
e-mail: vnb.at.physics.unipune.ac.in

3) Dr. P.D.Sahare,
Department of Physics & Astrophysics,
University of Delhi,
Delhi-110 007
e-mail: pdsahare.at.physics.du.ac.in
Campus Phone: 27666796, 27667793
Fax: 91-11-27667061

4) Prof. Donghwan Kim
Solar Cell Laboratory,
Department of Material Science
and Engineering, Korea University,
5-1 Anam-Dong, Sungbuk-Gu
Seoul, 136-713 Republic of Korea
e-mail: donghwan.at.korea.ac.kr

Extracurricular activities:

- 1) **Chairman** for “Raman Memorial Conference-2004” (RMC-04) student’s conference at Department of Physics, University of Pune.
- 2) **Volunteer** in International workshop on Synthesis of nanomaterials by Thermal Plasma Nov. 2004 Organized by Department of Physics and International Center for Theoretical Physics, Italy.
- 3) **Ex-officio member** Raman Memorial Conference-2005.
- 4) **Volunteer** in One Day National Seminar on Applications of Particle Accelerators 11th May. 2008 Organized by Department of Physics and Indian Physics Association.
- 5) **Session Chair**-14th Joint Symposium on Electronic Materials, August 18-21, 2011, Seoul, South Korea

Place: Pune

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Date: 07/09/2013