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Assistant Professor

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I am working as an assistant professor in the department of physics, central university of Rajasthan, Kishangarh. Ajmer, India. Prior to joining here, I have also worked at Delhi university for almost four years. I have completed Ph.D. in theoretical plasma physics from Indian Institute of Technology, Delhi. I have published several research articles in International journals and conferences. My area of interest includes, theory and simulation of plasma waves and instabilities in magnetized and dusty plasma, quantum plasma and Hall magnetohydrodynamics.

TEACHING EXPERIENCE

[1] Assistant professor at Department of physics, Central University of Rajasthan, Ajmer, from Dec. 2015 onwards.

[2] Assistant Professor at Motilal Nehru College, University of Delhi from Feb. 2012 to Dec.2015.

Professional activities: Editorial member of IOSR Journal of Applied Physics (IOSR-JAP)

Reviewers of Journals

1. Physics of Plasma
2. Journal of Physics D: Applied Physics
3. International Journal of Ambient Energy
4. Plasma Research Express (PREX)
5. Plasma Sources Sci. Technol. – PSST
6. Journal of Renewable and Sustainable Energy

Membership of professional bodies

1. Life member of Indian Association of Physics Teachers (11594 - L7588)

2. Life Member of Plasma Science Society of India (**LM-1349**)
3. Life Member of Indian Science Congress Association (**L33892**)
4. AAPPS-DPP (Division of Plasma Physics) **1240**

LIST OF PUBLICATIONS:

- [1] Effects of initial ion velocity, magnetic field and plasma density profiles 4 in simulating the plasma plume in a Hall thruster The Journal of Astrophysics and Astronomy. J. Astrophys. Astr. (2023) 44:3
- [2] The spatial damping of electrostatic wave in Hall thruster beam plasma, the Journal of Theoretical and Applied Physics, Vol.16, No. 4, 162237 (1-6), 2022
- [3] Studies of Growing waves in Hall thruster beam plasma under the influence of electron temperature, The Journal of Astrophysics and Astronomy.2022
- [4] Dispersive Features of Electrostatic Waves in Bounded Quantum Plasma under the Effect of Ionization, The Journal of Astrophysics and Astronomy.2022
- [5] Singh, S., Luyt, A.S., Bhoopal, R.S. et al. Estimation of Mechanical Properties of Copper Powder Filled Linear Low-Density Polyethylene Composites. J. Vib. Eng. Technol. (2022). <https://doi.org/10.1007/s42417-022-00496-x> Journal of Vibration Engineering & Technologies. 16 April 2022
- [6] Investigations of Physical properties of transparent conducting aluminium-doped zinc oxide films prepared by Sol-gel Method for sensor application, Indian Journal of Pure & Applied Physics (IJPAP)2022
- [7] Bharti, S. P.; Singh, S.; Kumar, S.; Meena, S. K.(2021), Electron Beam Plasma Instability in Hall Thruster Devices. Jñānābha, 51 114-124. May 06
- [8] R. P Singh, Sukhmander Singh, Reenu Gill, Rishi Kumar, Pradeep Sharma , Gurupal Kumar , Adriaan S. Luyt. Computational studies for the effective electrical conductivity of Copper powder filled LDPE/LLDPE composites. Indian Journal of Pure & Applied Physics (IJPAP) Vol. 58, June 2020, pp. 486-493. Impact Factor 0.653
- [9] Jasvendra Tyagi, **Sukhmander Singh**, Hitendra K. Malik, Effect of dust on tilted electrostatic resistive instability in a Hall thruster. Journal of Theoretical and Applied Physics, 12, 39-43, 2018 (March).
- [10] **Sukhmander Singh** and Saty Prakash Bharti. Studies on growth rate of electron streaming instability in magnetized quantum dusty plasmas, AIP Conference Proceedings 2220, 130060 (2020)

- [11] **Sukhmander Singh**, Dispersion equation for electrostatic ion cyclotron instability under the effect of ionization in a dusty plasma. AIP Conference Proceedings 1953, 140149 (2018-May).
- [12] Nidhi Pathak, Sukhdeep Kaur, and **Sukhmander Singh**, Study of self-focusing of Non Gaussian laser beam in a plasma with density variation using moment theory approach. Citation: AIP Conference Proceedings 1953, 060017 (2018).
- [13] O.P. Malik, **Sukhmander Singh**, Hitendra K. Malik, A. Kumar. Low and high frequency instabilities in an explosion- generated-plasma and possibility of wave triplet . **Journal of Theoretical and Applied Physics (2015) Vol. 9 Pgs.75 -80.**
- [14] O.P. Malik, **Sukhmander Singh**, Hitendra K. Malik, A. Kumar. High frequency instabilities in an explosion-generated-relativistic-plasma. **Journal of Theoretical and Applied Physics (2015) Vol. 9, Pgs.105-110.**
- [15] H.K. Malik and **S. Singh**. Resistive instability in a Hall plasma discharge under ionization effect. **Physics of Plasmas (2013) Vol. 20, Pgs. 052115 (1-8).**
- [16] **S. Singh**, H. K. Malik and Y. Nishida. High frequency electromagnetic resistive instability in a Hall thruster under the effect of ionization. **Physics of Plasmas (2013) Vol. 20, Pgs. 102109 (1-7).**
- [17] **S. Singh** and H. K. Malik. Role of ionization and electron drift velocity profile to Rayleigh instability in a Hall thruster plasma: cutoff frequency of oscillations. **Journal of Applied Physics (2012) Vol. 112, Pgs. 013307(1-7).**
- [18] H.K. Malik and **S. Singh**. Conditions and growth rate of Rayleigh instability in a Hall thruster under the effect of ion temperature. **Physical Review E (2011) Vol. 83, Pgs. 036406 (1-8).**
- [19] **S. Singh** and H.K. Malik. Growth of low frequency electrostatic and electromagnetic instabilities in a Hall thruster. **IEEE Transactions on Plasma Science (2011) Vol. 39, Pgs. 1910-1918.**
- [20] **S. Singh** and H.K. Malik. Resistive instabilities in a Hall thruster under the presence of collisions and thermal motion of electrons. **The Open Plasma Physics Journal (2011) Vol. 4, Pgs. 16-23.**

- [21] T. Mohanty, **S. Dhounsi**, P. Kumar, A. Tripathi, D. Kanjilal. 250 keV Ar²⁺ ion beam induced grain growth in Tin oxide thin films. **Surface & Coatings Technology (Elsevier) (2009) 203, Pgs. 2410-2414.**
- [22] O.P. Malik, S. Singh, H. K. Malik and A. Kumar. Electron Inertia Effect on High Power Electromagnetic Radiation Generated from Explosive and High Frequency Instabilities, International Conference on Recent Trends in Electronics Communication and VLSI, 28-30, September 26, 2013, ASET, Faridabad, India.
- [23] S. Singh, O.P. Malik, H. K. Malik. and A. Kumar. High power microwave and high altitude electromagnetic pulse sources and their application, pages (10-13). National Conference on Advancement in VLSI, Embedded and Communication, August, 2014, Al- Falah University, Faridabad, India
- [24] J. Tyagi, S. Singh and H K. Malik. Contribution of dust grains to Rayleigh–Taylor instability in a Hall Thruster (Pages- 252-255). National Conference on Advancement in VLSI, Embedded and Communication, August, 2014, Al- Falah University, Faridabad, India.
- [25] O.P. Malik, S. Singh, H. K. Malik. and A. Kumar. effect of Dust particulates on High - Frequency Instability generated in an Explosive. National Conference on Advancement in VLSI, Embedded and Communication, August, 2014, Al- Falah University, Faridabad, India.

Books published/ edited

1. Rayleigh Taylor and Resistive Instabilities in Hall Thrusters (ISBN-13: 978-613-8-83477-9), Scholars press Plasma Science,
2. Selected Topics in Plasma Physics, (ISBN 978-1-83962-679-1) IntechOpen, London, United Kingdom

Book Chapters publications

- [1] Singh, S.; Kumar, S.; Meena, S. K.; Saini, S. K. (2021), Introduction to Plasma Based Propulsion System: Hall Thrusters, chapter in the book propulsion - new

- perspectives and applications, ISBN 978-1-83968-835-5 , Published by IntechOpen, London, United Kingdom.
- [2] Singh, S.; Tyagi, A.; Vidhani, B. (2021), Physics of Absorption and generation of Electromagnetic Radiation, chapter in the book, Electromagnetic Wave Propagation for Industry and Biomedical Applications, ISBN 978-1-83968-582-8, Published by IntechOpen, London, United Kingdom.
- [3] Singh, S.; Vidhani, B.; Tyagi, A. (2021), Numerical Investigations of Electromagnetic waves and turbulences in Hall Plasma Thrusters Using Two fluid approach, chapter in the book, Plasma Science and Technology, ISBN 978-1-83969-624-4
- [4] sukhmander Singh, Evolutions of Growing Waves in Complex Plasma Medium in the book Computational Overview of Fluid Structure Interaction IntechOpen, London, United Kingdom, ISBN(print): 978-1-83969-175-1, April 15th 2020, IntechOpen, London, United Kingdom, Nov **2020**
- [5] sukhmander Singh, Waves and Instabilities in E X B Dusty Plasma in the book “Thermophysical Properties of Complex Materials” (ISBN 978-1-78984-889-2) IntechOpen, London, United Kingdom, **December 12th 2019**
- [6] sukhmander Singh, Dynamics of Rayleigh-Taylor Instability in Plasma Fluids in the book Computational Overview of Fluid Structure Interaction IntechOpen, London, United Kingdom, ISBN(print): 978-1-83969-175-1, April 15th 2020
- [7] sukhmander Singh, Hall Thruster: An Electric Propulsion through Plasmas in the book Plasma Science (ISBN 978-1-83962-679-1) IntechOpen, London, United Kingdom, **March 2nd 2020**
- [8] Ceramic nanoparticles doped liquid crystals: A review of material properties for display applications Rishi Kumar, Rajpal Singh, Sukhmander Singh, and K.K. Raina, 371-385, IN THE BOOK Advanced Ceramics for Versatile Interdisciplinary Applications, ISBN: 978-0-323-89952-9
- [9] S. Singh, R. Malik and H. K. Malik. Review on Direct Thermal Energy Converter: Magnetohydrodynamics Power Generator”. National Conference on Electrical Energy: Safety and Conservation” EESC proceeding of Delhi University, New

Delhi, India. Pgs. 17-18, Jan 22 - 23, 2016. (ISBN : 978-93-82825-51-7) Shri Krishan Satiya Sadan, New Delhi -110084

- [10] R. Malik, J. Tyagi, S. Singh and H. K. Malik. Derivation of Dispersion Equation under Dust Charge Fluctuation in a Hall Thruster. National Conference on Electrical Energy: Safety and Conservation” EESC proceeding of Delhi University, New Delhi, India. Pgs. 29-30, Jan 22 - 23, 2016. (ISBN : 978-93-82825-51-7) Shri Krishan Satiya Sadan, New Delhi -110084
- [11] Sukhmander Singh and Anuraj Sunda, A note on the applications of terahertz radiation in health Science, national conference on smart energy resources and sustainable engineering. (ISBN : 978-93-5391-131-7), Published by Energy@SSNC, Swami Shraddhanand College University of Delhi, March 2019
- [12] sukhmander Singh, Mukesh kumar and Vinay kumar, Growth rate of streaming instabilities in quantum dusty plasmas, national conference on smart energy resources and sustainable engineering. (ISBN : 978-93-5391-131-7) Published by Energy@SSNC, Swami Shraddhanand College University of Delhi, March 2019
- [13] S. Singh, O.P. Malik and H. K. Malik. High Frequency Instability in an Explosive generated Relativistic Plasma, National Seminar on Applications of Basic Sciences in Engineering and Technology (NSABSET-2013) Pages.(14-16) December 27 -28, 2013, ECHELON Institute of Technology, Faridabad, India. **ISBN: 978-93-82880-96-7.**
- [14] O.P. Malik, M. K. Rana, S. Singh, and H. K. Malik. Investigation of High Altitude Electromagnetic Pulse Propagation under Relativistic Effect of Electrons. National Seminar on Applications of Basic Sciences in Engineering and Technology (NSABSET-2013) Pages (85-87) December 27 -28, 2013 ECHELON Institute of Technology, Faridabad, India. **ISBN: 978-93-82880-96-7**

Workshop/ school attended:

[1] Refresher Course in Statistical Physics Sir P T Sarvajanic College of science, Surat, Gujarat from 10th to 22th June 2019, Indian academy of Science Bangalore.

[2] Attended the UGC 105th orientation programme conducted by the UGC HRDC, Rajasthan University, Jaipur on 4-30 December 2017.

[3] Attended 3 weeks SERB school on High Intensity Laser plasma Interaction :Theory and Simulation at IIT Delhi, organized by prof V K Tripathi (May 5-23, 2014) .

[4] Attended in a workshop for the Paper Science and Life, organized by Delhi university on June 21-22 (2013).

[5] Attended 5-days Online Faculty Development Program (FDP) on the topic entitled “theoretical and practical aspects in applied physics” (TAPAAP-2021) from 24th September – 28th September, 2021 organized by An Initiative of Radha Govind Group of Institutions Meerut, Uttar Pradesh, India (AICTE-ATAL Sponsored Faculty Development Programme).

[6] Attended five days Faculty Development Programme (FDP) from 23/08/2021 to 27/08/2021 on “Quantum Information Processing & Applications organized by department of computer Science Punjab, Central University of Punjab, Bathinda.

Conferences presentations:

1. Sukhmander Singh. Electrostatic and electromagnetic ionization driven instabilities in Hall thrusters. 2nd International Conference on Plasma Theory and Simulation (online) 20 – 22 June, 2022, Department of Physics, University of Lucknow, India
2. Review on Instabilities and Rotating Spatial Structures in Hall Thruster, in Two Days National Conference on "Chandra's Contribution in Plasma Astrophysics". OCT 19-20, 2021, SPS JNU
3. Sukhmander Singh. Numerical Studies of Dissipative Instabilities in Hall Thruster Plasma, in “International e-Conference on Plasma Theory and Simulations (PTS-2020)”, from 14-15, September 2020, organized by Department of Pure and Applied Physics, Guru Ghasidas Central University, Bilaspur, C.G. (India).

4. Sukhmander Singh. Study of Rayleigh Taylor Instability in the Ionization regions in Quantum Plasmas, 16th May 2020 of the International E - Conference held at Department of Physics, Ch. Charan Singh University, Meerut, UP, INDIA.
5. Sukhmander Singh. studies for stabilizations of waves and instabilities in a density gradients hall thruster plasmas, ICPSA 2019: 12th International Conference on Plasma Science and Applications (ICPSA 2019), Department of Physics, University of Lucknow, Lucknow, India, November **11-14, 2019**
6. Sukhmander Singh. Effect of Magnetic Drift Velocity on Gradient Driven Instabilities in a Hall Thruster. The 33rd National Symposium on Plasma Science & Technology (PLASMA-2018), December 4- 7, 2018 held at Department of Physics and Astrophysics, University of Delhi, Delhi In Association with Plasma Science Society of India
7. Sukhmander Singh. Introduction to Plasma Based Propulsion Systems: Hall Thrusters in Rajasthan Science Congress (RSC 2018) held on Oct.13-15, 2018 at Central Univ. of Rajasthan.
8. Sukhmander Singh. Dispersion Equation for electrostatic Ion Cyclotron Instability Under the Effect of Ionization in a Dusty Plasma, in the 2nd International Conference on Condensed Matter & Applied Physics Engineering College, Bikaner. Karni Industrial Area, Pugal Road, Bikaner (Rajasthan) India on November 24-25, 2017.
9. Sukhmander Singh. Density Gradients Instability in a Hall Discharge Plasmas. International conference on High Power Coherent Radiation Generation & its Interaction with Matter. Held at Samrat Ashok Technological Institute, Vidisha (M.P.) February 12-14, 2016.
10. S. Singh. Future Space Technology: Hall Effect Thruster. IISF-2015: Young Scientists' Meet 2015, (Paper code 31: Design & Manufacturing Technologies for 'Make In India') at IIT Delhi, New Delhi, December 04-08, 2015.
11. S. Singh. Stability Analysis of Electric Propulsion Engine. IISF-2015: Young Scientists' Meet 2015, (Paper code: 77. Indigenous Science & Technology) at IIT Delhi, New Delhi. December 04- 08, 2015.
12. S Singh, R Malik, J Tyagi and H K Malik. Two Dimensional Analyses for Plasma Acceleration Process in a Hall Thrusters. 30th National Symposium on Plasma Science & Technology, PLASMA December 1-4, 2015

13. J Tyagi, S Singh and H K. Malik. Rayleigh–Taylor instability in a Hall Thruster. National Conference on Advancement in VLSI, Embedded and Communication , August, 2014, Al-Falah University, Faridabad, India.
14. O.P. Malik, S. Singh, H. K. Malik. and A. Kumar. High Frequency Instability generated in an Explosive plasma. National Conference on Advancement in VLSI, Embedded and Communication, 21 August, 2014, Al- Falah University, Faridabad, India.
15. J. Tyagi, S. Singh and H. K. Malik . Growth Rate of Rayleigh Taylor Instability in a Hall Thruster Dusty Plasma. International Conference on Research Trends in Interdisciplinary Sciences : Opportunities and Challenges (RTISOC-2014) Feb. 28 - March 1, 2014, M. M. College, Modinagar-201204 (U. P.) India.
16. O.P. Malik, S. Singh, H. K. Malik and A. Kumar. Dust Contribution to Excitation of High - Frequency Instability generated in an Explosive. International Conference on Research Trends in Interdisciplinary Sciences : Opportunities and Challenges (RTISOC-2014) Feb. 28 - March 1, 2014, M. M. College, Modinagar-201204 (U. P.) India.
17. S. Singh, J. Tyagi and H. K. Malik and R. P. Dahiya. Effect of Dust Particulates on Rayleigh -Taylor Instability in a Hall Thruster Plasma, 7th International Conferences on the Physics of Dusty Plasmas (ICPDP- 2014), Page 88, March 3-7 , 2014, New Delhi, India.
18. S. Singh, O.P. Malik, H. K. Malik. and A. Kumar. High power microwave and high altitude electromagnetic pulse. National Conference on Advancement in VLSI, Embedded and Communication, 21 August, 2014, Al- Falah University, Faridabad, India.
19. S. Singh and H.K. Malik. Effects of magnetic field gradient on plasma plume in al Hall thruster. Laser Driven Charged Particle Acceleration and Applications, Indian Institute of Technology Delhi, India (April 5 - 7, 2013).
20. S. Singh, O.P. Malik and H. K. Malik, High Frequency Instability in an Explosive generated Relativistic Plasma, National Seminar on Applications of Basic Sciences in Engineering and Technology, December 27 -28, 2013, ECHELON Institute of Technology, Faridabad, India.
21. S. Singh and H.K. Malik. Effect of Magnetic Field and Density Profiles on Plasma Plume of a Hall Thruster. National Conference on Physics of Engineering Materials, at Deenbandhu Chhotu Ram University of Science and Technology (DCRUST), Murthal, Sonapat, Haryana (15-17 March 2013).

22. S. Singh and H. K. Malik. Conditions and Growth Rate of Rayleigh Instability in a Hall Thruster under the Effect of Ionization. 53rd Annual Meeting of the American Physical Society-Division of Plasma Physics, Salt Lake City, Utah, USA (Nov. 14 - 18, 2011) 210.
23. S. Singh and H.K. Malik. Study of Resistive Instability in a Hall Thruster. 52nd Annual Meeting of the American Physical Society-Division of Plasma Physics, Chicago, Illinois, USA (Nov. 8 – 12, 2010)
24. S. Singh and H.K. Malik, “Rayleigh Instability in a Hall Thruster: Effect of Ion Temperature and Magnetized Field” 52nd Annual Meeting of the American Physical Society-Division of Plasma Physics, Chicago, Illinois, USA (Nov. 8 – 12, 2010) 124.
25. S. Singh and H.K. Malik. “Rayleigh Instability in a Hall Thruster: Effect of Ion Temperature” 24th National Symposium on Plasma Science and Technology (PLASMA-2009), Hamirpur, India.

M.Sc. Theses Supervision

1. 2020MSPH002 AKANKSHA NAMDEO Jan –May 2022
2. 2020MSPH012 LAXMI MEENA Jan –May 2022
3. 2019IMSBPH011 CHARU SHARMA Jan –May 2022
4. 2019IMSBPH024 SUNITA NAGAR Jan –May 2022

5. 2016imsph015 Vikas Jan –May 2022

6. 1 2019MSPH002 AKASH BASHIR , Jan-July 2021
7. 2. 2019MSPH003 AMIT YADAV , Jan-July 2021
8. 3. 2019MSPH010 NIRMAL KUMAR , Jan-July 2021
9. 4. 2016IMSPH011 SUBHAM MEHTA, Jan-July 2021

10. Ankit Dariya, 2018MSPH011, Jan -May 2020
11. BHEEM VERMA, 2018msph002, Jan -May 2020
12. SAPAN KUMAR SONI, 2018msph005, Jan -May 2020
13. SAT PAL,2015imsph022 , Jan -May 2020

14. Anuraj Sunda 2014imsph003 in Jan- May 2019
15. Nisha Sharma 2013_imsph in Jan- May 2019
16. Namrata Verma 2015IMSBPH011 in Jan- May 2019
17. Akash K Meena 2013_imsph in Jan- May 2019
18. Arvind Guvavat 2013_imsph in Jan- May 2019

19. Vinay Kumar, 2016MSPH010 in Jan- May 2018
20. Jayanta Kumar Bera (2015MSBPH008) Jan- May 2018.
21. suman saini (2015IMSBPH020) in Jan-May 2018.
22. arpan bairagi 2015IMSBPH001 in Jan-May 2018.
23. Yasha Sharm (2015MSPH023) in Jan-May 2017
24. Gourav Rana (2015MSPH006) in Jan- May 2017
25. Khushbu Nagar (2015MSPH012) in Jan-May 2017
26. Baleshwar Mahto (2015MSPH003) in Jan-May 2017
27. Pooja Ahrodia (2015msph017) in Jan-May 2017
28. Jyoti Sheshma (2015MSPH009) in Jan-May 2017
29. Pushpa Sharma (2014MSPH016) in Jan-May 2016.
30. Devendra Kumar Singaria (2014MSPH007) in Jan-May 2016.

Research Project

Numerical Modeling for the Stabilization of Plasma in a Hall Thruster. UGC start up grants
11 march 17-19 (Rs. 10 lacs).