CURRICULUM VITAE

Madan Singh Chauhan

Assistant Professor
Department of Physics
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Educational Qualifications:

- **Ph.D. in Electronics Engineering (2015)**, Department of Electronics Engineering, Indian Institute of Technology (Banaras Hindu University), Varanasi, India.

  Ph.D. Topic: Analytical and Simulation Studies of Gyroklystron Amplifiers

  Advisor: Prof. P. K. Jain

- **Master of Science in Physics with Specialization in Microwave Electronics (2008),** University of Rajasthan, Jaipur, India (**Passed in 1st Div. with 69.41 % Marks**).
- **Bachelor of Education (2006),** Maharishi Dayanand University, Rohtak, India **(Passed in 1st Div. with 67.3 % Marks).**
- **Bachelor of Science (Hons.) in Physics (2005),** University of Delhi, Delhi, India (**Passed in 1st Div. with 68.57 % Marks**).
- **Intermediate (2001),** CBSE Board, **Passed in 1st Div. with 73.6% Marks.**
- **High School (1999),** CBSE Board, **Passed in 1st Div. with 72.5% Marks.**

Other Qualifications:

Qualified **Graduate Aptitude Test in Engineering (GATE) 2009** with GATE Score-376 in Physics and secure All India Rank (AIR) 649.

Current Research Interests:

- ✓ Gyroklystrons and other Gyro-Devices
- ✓ Design, Analysis and modeling of millimetre and THz wave sources and amplifiers
- ✓ Theory of beam-wave interaction, electron beam formation and electron beam focusing and its implementation in the development of computer codes.

Professional & Research Experiences:

Present:

Place of Work: Department of Physics, DDU Gorakhpur University
Gorakhpur (Uttar Pradesh)-273009, India.

- **Assistant Professor (Physics)** (July, 2018-Present)

Others:

Place of Work: Department of Electronics & Comm. Engineering, Indian Institute of Technology Roorkee, Roorkee-247667, India.

- **DST SERB Post Doctoral Fellow** (March, 2017-July, 2018)

Place of Work: Department of Science & Humanities, Vignan University
Guntur (Andhra Pradesh)-522213, India.

- **Assistant Professor (Physics)** (June, 2016-March, 2017)

Place of Work: Department of Electronics Engineering, Indian Institute of Technology (Banaras Hindu University), Varanasi-221005, India.

- **Research Associate** (March, 2015-March 2016)
- **Teaching Assistantship** (July, 2012-January 2015)
- **Senior Research Fellow** (September, 2011-June 2012)
- **Junior Research Fellow** (September, 2009- September, 2011)

Place of Work: Central Electronics Engineering Research Institute (CEERI-Pilani), Pilani-333031, India.

- **Project Assistant** (July, 2008- July, 2009)

Research Project:

Principal Investigator, DST SERB project on "Analysis, Design and Simulation of a Frequency Doubling W-Band Gyroklystron Amplifier" under DST National Post-Doctoral Fellowship scheme (Rs. 19.20 lac), March 2017 – July 2018.

Software for Practical Applications:

- Matlab, CST Microwave Studio, CST Particle Studio, MAGIC & EGUN
- Development of Codes: Design and analysis of gyroklystron amplifiers
- LaTex

Awards and Achievements:

1. Awarded DST SERB National Post Doctoral Fellowship (N-PDF).
2. Awarded Senior Research Fellowship in Dept. of Electronics Engineering, Indian Institute of Technology (Banaras Hindu University), India.

3. Awarded Junior Research Fellowship in Dept. of Electronics Engineering, Indian Institute of Technology (Banaras Hindu University), India.
4. Best paper award in International Conference on Microwaves, Antenna, Propagation & Remote Sensing (ICMARS-2011), Jodhpur, India, 7-10 December 2011 for paper, M. V. Swati, **M. S. Chauhan** and P. K. Jain "Beam wave interaction study of gyroklystrons".
5. Best paper award in International Conference on Microwaves, Antenna, Propagation & Remote Sensing (ICMARS-2012), Jodhpur, India, 11-15 December 2012 for paper, M. V. Swati, **M. S. Chauhan** and P. K. Jain "Analytical Study of a Four-Cavity Gyroklystron Amplifier".
6. Best paper award in International Conference on Microwaves, Antenna, Propagation & Remote Sensing (ICMARS-2013), Jodhpur, India, 11-14 December 2013 for paper, M. V. Swati, **M. S. Chauhan** and P. K. Jain "Multimode Analysis of a 35 GHz Gyroklystron Amplifier".

List of Publications:

A. International Journals

[1] M. V. Swati, **M. S. Chauhan,** and P. K. Jain, "Clustered-Cavity Approach for the Performance Improvement of a Ka-Band Second-Harmonic Gyroklystron Amplifier," *IEEE Trans. on Electron Devices*, Vol. 67(3), pp. 1240-1247, 2020.

[2] M. V. Swati, **M. S. Chauhan,** and P. K. Jain, "Design Methodology and Beam–Wave Interaction Study of a Second-Harmonic D-Band Gyroklystron Amplifier," *IEEE Trans. on Plasma Science*, Vol. 44 (11), pp. 2844-2851, 2016.

[3] M. V. Swati, **M. S. Chauhan,** and P. K. Jain, "Time-Dependent, Multimode Interaction Analysis of the Gyroklystron Amplifier," *Physics of Plasmas*, Vol. 23 (8), pp. 083124(1-8), 2016.

[4] **M. S. Chauhan**, M. V. Swati, and P. K. Jain, "Nonlinear Analysis of a Gyroklystron Amplifier with Misaligned Electron Beam," *Journal of Fusion Energy*, Vol. 35 (2), pp. 289-298, 2016.

[5] **M. S. Chauhan**, M. V. Swati, and P. K. Jain, "Design and simulation of a gyroklystron amplifier," *Physics of Plasmas*, Vol. 22(3), pp. 033111(1-10), 2015.

[6] **M. S. Chauhan,** M. V. Swati and P. K. Jain, "PIC Simulation Study of a 35 GHz, 200 kW Gyroklystron," *Journal of Microwaves, Optoelectronics and Electromagnetic Applications*, Vol. 12 (2), pp. 116-125, 2013.

[7] **M. S. Chauhan, M. V. Swati** and P. K. Jain, "Electron Beam Phase Bunching Mechanism in the Gyroklystron Amplifier," *International Journal of Microwaves Applications*, Vol. 4(3), pp. 17-20, 2015**.**

[8] **M. S. Chauhan,** M. V. Swati and P. K. Jain, "Estimation of the electronic efficiency of a gyroklystron amplifier," *International Journal of Microwaves Applications*, Vol. 2(1), pp. 23-27, 2013.

[9] Sunny Paswan, **M. S. Chauhan,** M. V. Swati, and P. K. Jain, "Analytical Studies of a Five-Cavity, 140 GHz Gyroklystron Amplifier," *INROADS*, Vol. 3, No.1, pp. 153-156, 2014.

[10] M. V. Swati, Rajeev Sharma, **M. S. Chauhan,** and P. K. Jain, "Multimode Simulation and Analysis of Two-Cavity Gyroklystron," *INROADS*, Vol. 3, No.1, pp. 254-257, 2014.

B. International Conferences

[1] **M. S. Chauhan,** S. Yuvaraj, P. K. Jain and M.V. Kartikeyan, "Design of a W-Band, 100 kW, Frequency Doubling Gyroklystron Amplifier," International Vacuum Electronics Conference (IVEC-2018), Monterey, California, USA, April 24-26, 2018.

[2] S. Yuvaraj, Delphine Alphonsa Jose, **Madan Singh Chauhan,** Stefan Illy and M. V. Kartikeyan, "Design studies of a Magnetron Injection Gun for a 2MW, Multi-frequency (220/251.5/283 GHz) Triangular Corrugated Coaxial Cavity Gyrotron," International Vacuum Electronics Conference (IVEC-2018), Monterey, California, USA, April 24-26, 2018.

[3] S. Yuvaraj, Delphine Alphonsa Jose, Sukwinder Singh, **Madan Singh Chauhan** and M. V. Kartikeyan "Eigenvalue Analysis of a Triangular Corrugated Coaxial Cavity with Misaligned Inner Rod," 11th German Microwave Conference, (GeMIC-2018), Freiburg, Germany, March 12-14, 2018.

[4] S. Yuvaraj, Delphine Alphonsa Jose, **Madan Singh Chauhan,** M. V. Kartikeyan, and M. Thumm, "RF Behavior of a 220/251.5 GHz, 2MW, Triangular Corrugated Coaxial Cavity Gyrotron extended to the Third Operating Frequency 283 GHz," 11th German Microwave Conference, (GeMIC-2018), Freiburg, Germany, March 12-14, 2018.

[5] S. Yuvaraj, **Madan Singh Chauhan**, Delphine Alphonsa Jose, and M.V. Kartikeyan, "Design study of a Quasi-Optical Launcher for 2 MW, 170 GHz Coaxial Cavity Gyrotron," 3rd International conference on Microwave and Photonics (ICMAP-2018), Dhanbad, India, February 9-11, 2018.

[6] Delphine Alphonsa Jose, S. Yuvaraj, **Madan Singh Chauhan,** and M.V. Kartikeyan, "Design of a Magnetron Injection Gun for a 4 MW, 170 GHz, Coaxial Cavity Gyrotron, 14th IEEE India Council International conference (INDICON-2017), Roorkee, India, December 15-17, 2017.

[7] M. V. Swati, **M. S. Chauhan,** and P. K. Jain, "Time-Dependent Nonlinear Analysis of a Second Harmonic Gyroklystron Amplifier," 15th International Symposium on Microwave and Optical Technology (ISMOT-2015), Dresden, Germany, pp. 174-177, 29 June-01 July 2015.

[8] M. V. Swati, **M. S. Chauhan,** and P. K. Jain, "Multimode Analysis of a W-Band Gyroklystron Amplifier," IEEE MTT-S International Microwave and RF Conference, (IMaRC-2014), Bangalore, India, pp. 222-225, 15-17 December 2014.

[9] Sunny Paswan, **M. S. Chauhan,** M. V. Swati, and P. K. Jain, "Analytical Studies of a Five-Cavity, 140 GHz Gyroklystron Amplifier," International Conference on Innovative Advancements in Engineering And Technology (IAET-2014), Jaipur, India, 7-8 March 2014.

[10] M. V. Swati, Rajeev Sharma, **M. S. Chauhan,** and P. K. Jain, "Multimode Simulation and Analysis of Two Cavity Gyroklystron," International Conference on Innovative Advancements in Engineering And Technology (IAET-2014), Jaipur, India, 7-8 March 2014.

[11] **M. S. Chauhan,** M. V. Swati and P. K. Jain, "Performance Evaluation of a Four-Cavity Gyroklystron Amplifier," International Conference on Microwaves, Antenna, Propagation & Remote Sensing (ICMARS-2013), Jodhpur, India, pp. 232-234, 11-14 December 2013.

[12] M. V. Swati, **M. S. Chauhan** and P. K. Jain, "Non-Linear, Time-Dependent, Multimode Analysis of Gyroklystron Amplifier," International Conference on Microwaves, Antenna, Propagation & Remote Sensing (ICMARS-2013), Jodhpur, India, pp. 222-225, 11-14 December 2013.

[13] **M. S. Chauhan** and P. K. Jain, "Analytical and simulation studies of a 35 GHz gyroklystron," International Conference on Microwaves, Antenna, Propagation & Remote Sensing (ICMARS-2012), Jodhpur, India, 11-15 December 2012.

[14] M. V. Swati, **M. S. Chauhan** and P. K. Jain, "Analytical Study of a Four-Cavity Gyroklystron Amplifier," International Conference on Microwaves, Antenna, Propagation & Remote Sensing (ICMARS-2012), Jodhpur, India, 11-15 December 2012.

[15] **M. S. Chauhan** and P. K. Jain, "Study of stagger-tuning in the gyroklystrons," Progress In Electromagnetics Research Symposium (PIERS-2012), Kuala Lumpur, Malaysia**,** pp. 1720-1724, 27-30 March 2012.

[16] M. V. Swati, **M. S. Chauhan** and P. K. Jain, "Beam wave interaction study of gyroklystrons," International Conference on Microwaves, Antenna, Propagation & Remote Sensing (ICMARS-2011), Jodhpur, India, 7-10 December 2011.

[17] **M. S. Chauhan** and P. K. Jain, "Study of electron bunching in gyroklystrons," International Vacuum Electronics Conference (IVEC-2011), Bangalore, India, pp. 289-290, 21-24 February 2011.

C. National/Symposiums/Conferences

[1] **Madan Singh Chauhan,** S. Yuvaraj, and M.V. Kartikeyan, "Preliminary Design of a Frequency Doubling Gyroklystron," National Symposium on Vacuum Electronic Devices & Applications (VEDA-2017), Roorkee, India, November 17-19, 2017.

[2] Delphine Alphonsa Jose, S.Yuvaraj, **Madan Singh Chauhan**, and M.V. Kartikeyan, "Design Studies of a Triode type Magnetron Injection Gun for a Megawatt class, sub-THz wave Coaxial Cavity Gyrotron," National Symposium on Vacuum Electronic Devices & Applications (VEDA-2017), Roorkee, India, November 17-19, 2017.

[3] S.Yuvaraj, Delphine Alphonsa Jose, **Madan Singh Chauhan**, and M.V. Kartikeyan, "Mode Selection Studies for a 2 MW, DEMO class Multi-frequency Coaxial Cavity Gyrotron," National Symposium on Vacuum Electronic Devices & Applications (VEDA-2017), Roorkee, India, November 17-19, 2017.

[4] **M. S. Chauhan,** M. V. Swati, and P. K. Jain, "Effect of Drift Tubes Misalignment on the Gyroklystron Amplifiers Performance," National Conference on Emerging Trends in Vacuum Electron Devices & its Applications (VEDA-2015), Bangalore, India, pp. 39-42, 03-05 December 2015.

[5] M. V. Swati, **M. S. Chauhan,** and P. K. Jain, "PIC Simulation of a Ka-Band Second-Harmonic Gyroklystron Amplifier," National Conference on Emerging Trends in

Vacuum Electron Devices & its Applications (VEDA-2015), Bangalore, India, pp. 107-109, 03-05 December 2015.

[6] **M. S. Chauhan,** M. V. Swati, and P. K. Jain, "Effect of Cavities Misalignment on Gyroklystron Performance," National Workshop on Vacuum Electron Devices & its Applications (VEDA-2014), Indore, India, 20-21 March 2015.

[7] M. V. Swati, **M. S. Chauhan** and P. K. Jain, "Parametric Analysis of a W-band Gyroklystron Amplifier," National Workshop on Vacuum Electron Devices & its Applications (VEDA-2014), Indore, India, 20-21 March 2015.

[8] M. V. Swati, **M. S. Chauhan** and P. K. Jain, "Beam-Wave Interaction Study of a Second Harmonic Gyroklystron Amplifier," National Conference on Recent Advances in Electronics & Computer Engineering (RAECE-2015), Roorkee, India, 13-15 February 2015.

[9] **M. S. Chauhan,** M. V. Swati and P. K. Jain, "Design and Simulation of a Four-Cavity Gyroklystron Amplifier," National Workshop on Vacuum Electron Devices & its Applications (VEDA-2013), Roorkee, India, 18-20 October 2013.

[10] M. V. Swati, **M. S. Chauhan** and P. K. Jain, "Multimode Behaviour Study of a Gyroklystron Amplifier," National Workshop on Vacuum Electron Devices & its Applications (VEDA-2013), Roorkee, India, 18-20 October 2013.

[11] **M. S. Chauhan,** M. V. Swati and P. K. Jain, "PIC simulation of 35 GHz three cavity gyroklystron," National Conference on Vacuum Electron Devices & its Applications (VEDA-2012), Pilani, India, pp. 124-125, 21-24 September 2012.

[12] **M. S. Chauhan,** M. V. Swati and P. K. Jain, "Beam-wave Interaction study of three-cavity gyroklystron," National Conference on Recent Trends on Microwave Techniques and Applications (Microwave-2012), Jaipur, India, pp. MW1242(1-4), 30 July to 1 August 2012.

[13] M. V. Swati, **M. S. Chauhan** and P. K. Jain, "Study of linear theory for the gyroklystrons," Symposium cum Exposition on Vacuum Electron Devices & its Applications (VEDA-2011), Ghaziabad, India, pp. 33-36, 18-19 November 2011.

[14] **M. S. Chauhan** and P. K. Jain, "PIC simulation of 28 GHz, 200 kW gyroklystron, Symposium cum Exposition on Vacuum Electron Devices & its Applications (VEDA-2011), Ghaziabad, India, pp. 11-13, 18-19 November 2011.

[15] **M. S. Chauhan** and P. K. Jain, "Study of Start Oscillation Current Criteria in Gyroklystron Amplifiers, National Workshop on Vacuum Electron Devices & Applications (VEDA-2010) Moradabad, India, 18-19 November 2010.

[16] **M. S. Chauhan** and P. K. Jain, "Gyroklystron a Millimeter Wave Amplifier– Status and Capabilities, National Symposium on Vacuum Technology and its Applications to Electronic Devices and Systems (IVSNS-2009), Pilani, India, 11-13 November 2009.

[17] Debasish Pal**, M. S. Chauhan,** DeependerKant and L. M. Joshi, "Design of RF Cavities for a J Band Klystron, Symposium on Vacuum Electron Devices & Applications (VEDA-2009), Varanasi, India, 8-10 January 2009.

Participation in Schools/Work Shops/Short Term Courses:

1. QIP ShortTerm Course on Design of Microwave Antennas and Passive Components held at Indian Institute of Technology (Banaras Hindu University), Varanasi, India, 2016.
2. International Summer/Winter Term Course (ISWT) on High Power Microwaves held at Indian Institute of Technology, Kharagpur (IIT-KGP), Kharagpur, India, 2014.
3. Author Workshop held at Indian Institute of Technology (Banaras Hindu University), Varanasi, India, 2014.
4. National Workshop on Vacuum Electron Devices & Applications (VEDA-2013) held at Indian Institute of Technology, Roorkee (IITR), Roorkee, India, 2013.
5. Workshop on Recent Advances in Microwave Engineering held at Department of Electronics Engineering, IIT (BHU), Varanasi, India, 2012.
6. AICTE Staff Development Program on Advanced Microwave Technology held at Department of Electronics and Communication Engineering, Sagar Institute of Research, Technology & Science (SIRTS), Bhopal, India, 2011.
7. Tutorial on Microwave Tubes held at Indian Institute of Science (IISc.), Bangalore, 2011.
8. National Workshop on Vacuum Electron Devices & Applications (VEDA-2010) held at College of Engineering & Technology (CET), Moradabad, India, 2010.