DR. PRASHANT KUMAR VARSHNEY.....

Assistant Professor
Department of Electronics Engineering,
Indian Institute of Technology (ISM) Dhanbad
Nationality: Indian

0326-223-5383
pkvarshney@iitism.ac.in
https://bit.ly/3DQXoge
https://bit.ly/2VlsZFm

EDUCATION

Doctor of Philosophy (Ph.D.) January 2022
Department: Electrical Engineering
Institute: Indian Institute of Technology Kanpur, India
Performance: 9.0 CPI (on a scale of 10)

Master of Technology (M.Tech.) July 2016
Department: Electrical Engineering
Institute: Indian Institute of Technology Kanpur, India
Performance: 8.08 CPI (on a scale of 10)

Bachelor of Technology (B.Tech.) June 2014
Department: Electronics Engineering
University: Aligarh Muslim University (A.M.U.), India
Performance: 9.095 CPI (First Division with Honours)

Senior Secondary School Certificate (SSSC)/Class XII May 2010
University: Aligarh Muslim University (A.M.U.), India
Performance: 88.25% (First Division – Distinction in all subjects)

Secondary School Certificate (SSC)/Class X June 2008
University: Aligarh Muslim University (A.M.U.), India
Performance: 87% (First Division – Distinction in all subjects)

PROFESSIONAL EXPERIENCE

Assistant Professor April 2022 – Present
Department of Electronics Engineering, Indian Institute of Technology (ISM) Dhanbad, India

Visiting Assistant Professor February 2022 – March 2022
Department of Electronics Engineering, Indian Institute of Technology (ISM) Dhanbad, India

Graduate Student Researcher June 2015 – January 2022
Microwave Imaging and Material Testing Laboratory, Indian Institute of Technology Kanpur, India

- **Doctoral Researcher** (*Specialization: RF & Microwaves*) July 2016 – January 2022
  Thesis: Studies on Substrate Integrated Waveguide Based RF Sensors and Their Applications
  Supervisor: Professor M. Jaleel Akhtar
  - Investigated several aspects of the SIW based RF sensors in terms of (1) structural refinements for an accurate material testing and (2) expedition of new SIW sensor architectures and applications viz. the rotation sensing and sub-surface microwave imaging.
- **Master's Researcher** (*Specialization: RF & Microwaves*) June, 2015 – July, 2016
  Thesis: Design of Substrate Integrated Waveguide based Resonator Sensor for Material Characterisation
  Supervisor: Professor M. Jaleel Akhtar

AREAS OF RESEARCH

- Portable and hand-held RF measurement systems
- SIW based microwave planar sensors
- Metamaterial inspired microwave sensors for various applications
- Non-destructive RF testing
- EM characterization of dielectric and magnetic materials
- Imaging of concealed objects

TEACHING EXPERIENCE

Courses Taught

Course no. & Title	Level (UG/PG)	No. of Times	Academic session(s)
ECD508 – Microwave Devices and Circuits	PG (3-0-0)	1	2021-22 (WS)
ECD401 – Antenna and Wave Propagation	UG (3-0-0)	1	2021-22 (Summer)
ECC202 – Signals and Networks	UG (3-1-0)	4	2022-23 (MS), 2023-24 (MS & Summer), 2024-25 (MS)
ECC205 – Signals and Networks Lab	UG (0-0-2)	4	2022-23 (MS), 2023-24 (MS & Summer), 2024-25 (MS)
ECC309 – Microwave Engineering Lab	UG (0-0-2)	3	2022-23 (WS), 2023-24 (WS), 2024-25 (WS)
ECD541 – Microwave Measurements	PG (3-0-0)	1	2022-23 (WS)
ECC307 – Microwave Engineering	UG (3-0-0)	2	2023-24 (WS), 2024-25 (WS)

PUBLICATIONS

Papers in Refereed Journals

[IF: Impact Factor]

1. **P. K. Varshney**, A. Kapoor and M. J. Akhtar, “Highly Sensitive ELC Resonator Based Differential Sensor,” *IEEE Transactions on Instrumentation and Measurement*, vol. 70, pp. 1-10, Art no. 8004710, 2021. [IF: 4.016]
2. **P. K. Varshney** and M. J. Akhtar, "Permittivity Estimation of Dielectric Substrate Materials via Enhanced SIW Sensor," *IEEE Sensors Journal*, vol. 21, no. 10, pp. 12104-12112, May 2021. [IF: 3.301]
3. **P. K. Varshney** and M. J. Akhtar, "Substrate Integrated Waveguide Derived Novel Two-Way Rotation Sensor," *IEEE Sensors Journal*, vol. 21, no. 2, pp. 1519-1526, Jan. 2021. [IF: 3.301]
4. A. Kapoor, **P. K. Varshney** and M. J. Akhtar, “Interdigital capacitor loaded electric-LC resonator for dielectric characterization,” *Microwave and Optical Technology Letters*, vol. 62, no. 9, pp. 2835-2840, Sep. 2020. [IF: 1.392]
5. **P. K. Varshney**, A. Sharma and M. J. Akhtar, “Exploration of adulteration in some food materials using high-sensitivity configuration of electric-LC resonator sensor,” *International Journal of RF and Microwave Computer-Aided Engineering*, vol. 30, no. 2, p. 22045, Feb. 2020. [IF: 1.694]
6. **P. K. Varshney** and M. J. Akhtar, “A compact planar cylindrical resonant RF sensor for the characterization of dielectric samples,” *Journal of Electromagnetic Waves and Applications*, vol. 33, no. 13, pp. 1700-1717, Sep. 2019. [IF: 1.335]
7. N. K. Tiwari, A. K. Jha, S. P. Singh, Z. Akhter, **P. K. Varshney** and M. J. Akhtar, "Generalized Multimode SIW Cavity-Based Sensor for Retrieval of Complex Permittivity of Materials," *IEEE Transactions on Microwave Theory and Techniques*, vol. 66, no. 6, pp. 3063-3072, June 2018. [IF: 3.599]

Papers in Conference Proceedings

1. R. Prabha, and **P. K. Varshney**, "A Single Complementary Split Ring Shaped Fixed Frequency SIW Resonator for Rotation Sensing Application," *accepted in IEEE Microwave, Antenna and Propagation Conference (MAPCON) 2024*, Hyderabad, India.
2. R. Prabha, and **P. K. Varshney**, "Dual Slotted Complementary Rings Derived Substrate Integrated Waveguide Based Rotation Sensor for Enhanced Performance," *accepted in IEEE Asia Pacific Microwave Conference (APMC) 2024*, Bali, Indonesia.
3. A. Kapoor, **P. K. Varshney** and M J Akhtar, "Microstrip line loaded simple ELC resonator sensor for dielectric characterization," *Proceedings, IEEE MTT-S International Microwave and RF Conference (IMaRC)*, Mumbai, India, Dec. 13 – 15, 2019.
4. **P. K. Varshney** and M J Akhtar, "Supercoupling effect in substrate integrated waveguide loaded with mu-near-zero material and its potential application," *Proceedings, IEEE Asia-Pacific Microwave Conference (APMC)*, Singapore, Dec. 10 – 13, 2019.
5. **P. K. Varshney** and M. J. Akhtar, "A high Q substrate integrated waveguide resonator for microwave sensing of low loss materials," *Proceedings, 2019 International Conference on Electrical, Electronics and Computer Engineering (UPCON)*, Aligarh, India, Nov. 8 – 10, 2019.
6. **P. K. Varshney** and M. J. Akhtar, "Metamaterial Cell Loaded Substrate Integrated Waveguide sensor for Angular Displacement Measurement," *Proceedings, 8th Asia-Pacific Conference on Antennas and Propagation (APCAP)*, Incheon, South Korea, pp. 169-170, Aug. 4 – 7, 2019.
7. N. K. Tiwari, **P. K. Varshney**, S. P. Singh and M. J. Akhtar, "Shape Perturbed Tunable Planar RF Resonator for the Dielectric Measurement in wide frequency range," *Proceedings, 8th Asia-Pacific Conference on Antennas and Propagation (APCAP)*, Incheon, South Korea, pp. 666-667, Aug. 4 – 7, 2019.
8. **P. K. Varshney** and M J Akhtar, "Near Field Subsurface Microwave Imaging Using the Substrate Integrated Waveguide Based Planar Sensor," *Proceedings, IEEE MTT-S International Microwave and RF Conference (IMaRC)*, Kolkata, India, Nov. 28 – 30, 2018.
9. N. K. Tiwari, **P. K. Varshney**, S. Paul and M J Akhtar, "CSRR loaded SIW Structure based Novel Dielectric Sensing Methodology for mm-wave 5G Communication Band," *Proceedings, IEEE MTT-S International Microwave and RF Conference (IMaRC)*, Kolkata, India, Nov. 28 – 30, 2018.
10. N. K. Tiwari, **P. K. Varshney**, D. Mondal and M. J. Akhtar, "RF Sensor for Adulteration Detection of Liquid Silicone Used in Medical Industry," *Proceedings, 18th IEEE Mediterranean Microwave Symposium (MMS)*, Istanbul, Turkey, pp. 313-316, Oct. 31 – Nov. 2, 2018.
11. **P. K. Varshney**, N. K. Tiwari and M. J. Akhtar, "SIW cavity based compact RF sensor for testing of dielectrics and composites," *Proceedings, IEEE MTT-S International Microwave and RF Conference (IMaRC)*, New Delhi, India, Dec. 5 – 9, 2016.

FUNDED/ SPONSORED PROJECTS

Project Title	Budget (INR)	Funding Organization	Duration (status)	Role
Development of planar microwave sensor for adulteration detection	15 Lacs	IIT (ISM) Dhanbad (FRS Grant)	Oct. 2023 – Oct 2026 (Ongoing)	PI
Critical analysis, design, EM modelling and optimization of millimetre wave planar antenna	14,52,580/-	DRDO (CARS)	Jan. 2024 - ongoing	Co-PI

AWARDS, HONOURS AND ACHIEVEMENTS

- **Special Session Organizer** and **Technical Session Chair** in 5th International Conference on Multimedia, Signal Processing and Communication Technologies (IMPACT 2022) held at AMU Aligarh, India during 26-27th Nov. 2022.
- **Reviewer** for several IEEE and non-IEEE Journals and Conferences.
- **Finalist** for the **Best Paper Award** for the paper titled "Microstrip line loaded simple ELC resonator sensor for dielectric characterization" authored by Anush Kapoor, Prashant Kumar Varshney (*Presenter*) and M. Jaleel Akhtar, in IEEE MTT-S International Microwave and RF Conference (IMaRC) held at IIT Bombay, India during Dec. 13-15, 2019.
- **Travel grant** of **$1500** from IEEE Microwave Theory and Techniques Society (MTT-S) for attending *chapter chair meeting* during Asia Pacific Microwave Conference (APMC) held in Singapore in Dec. 2019.
- **Best Paper Award** for the paper titled "A high Q substrate integrated waveguide resonator for microwave sensing of low loss materials" authored by Prashant Kumar Varshney (*Presenter*) and M. Jaleel Akhtar in 2019 International Conference on Electrical, Electronics and Computer Engineering (UPCON) held at AMU Aligarh, India during 8th to 10th Nov. 2019.
- **Session Chair** in 8th Asia-Pacific Conference on Antennas and Propagation (APCAP) held at Incheon National University, Incheon, South Korea during Aug. 4-7, 2019.
- **Travel, accommodation and conference registration support** from the organizers to attend 8th Asia-Pacific Conference on Antennas and Propagation (APCAP) held at Incheon National University, Incheon, South Korea during Aug. 4-7, 2019.
- **Financial support** from Dean, Academic Affairs and Dept. of Electrical Engineering, IIT Kanpur for *presenting papers* in several international conferences during the PhD. duration.
- **Institute Assistantship** (on a monthly basis) from Ministry of Human Resource Development (MHRD), Govt. of India during the entire *Doctoral* as well *Master's Programme* from August 2014 till July 2021.
- **Qualified** prestigious Graduate Aptitude Test in Engineering (GATE) exam in 2014 for pursuing *Post-graduation* with an **All India Rank of 879** among over **2.1 lakhs candidates** in Electronics and Communication Engineering discipline.

ADMINISTRATIVE EXPERIENCE

Institute level

- Coordinator, Student Technology Clubs (NVCTI) — Aug.2022 –Aug.2023
- Faculty-In-Charge, Electronics and IoT Club (under NVCTI) — Apr. 2022 –Apr.2024
- DPAC member, STC; E & IoT Lab – NVCTI — Apr. 2023 –Apr.2024
- Member, M.Tech. Admission cell — Oct. 2024 - Present

Department level

- DUGC member, Dept. of ECE — Nov. 2022–Oct. 2024
- DFSC member, Dept. of ECE — Mar. 2023 - Present
- DPAC member, Dept. of ECE — Apr. 2023 – Present
- Timetable Coordinator — Sept. 2023 – Present
- Developed Signals and Networks Lab and Microwave Engineering lab

PROFESSIONAL AFFILIATIONS

- ✓ Institute of Electrical and Electronics Engineers (IEEE), (S'17 – M'22) — Jan. 2017 – Present
- ✓ IEEE Microwave Theory and Techniques Society (MTT-S) — Jan. 2018 – Present

- ✓ IEEE Antennas and Propagation Society (AP-S) Jan. 2019 – Present
- ✓ IEEE Council on RFID Jan. 2019 – Present
- ✓ IEEE Sensors Council Jan. 2018 – Present
- ✓ Institution of Electronics & Telecommunication Engineers (IETE), (M'23) Sept. 2023 - Present

PROFESSIONAL ACTIVITIES

- ❖ **Chair**, IEEE MTT-S Student Branch Chapter of IIT Kanpur Apr. 2019 – Feb. 2021
- ❖ **Vice-Chair**, IEEE MTT-S Student Branch Chapter of IIT Kanpur Jan. 2018 – Apr. 2019
- ❖ Participated in **Chapter Chair Meetings** held at APMC 2019 (*Singapore*), IMaRC 2019 (*Mumbai, India*) and IMaRC 2018 (*Kolkata, India*) and various other IEEE meetings.

TALKS AND PRESENTATIONS

Talks

- ❖ **Invited Talk** on 'Material characterization using various types of microwave sensor topologies and some other sensor applications'
  8th Asia-Pacific Conference on Antennas and Propagation (APCAP)
  Incheon National University, Incheon, South Korea Aug. 4-7, 2019
- ❖ **Short Course Lecture** on 'Material characterization technique using rectangular waveguide cavity perturbation method'
  8th Asia-Pacific Conference on Antennas and Propagation (APCAP)
  Incheon National University, Incheon, South Korea Aug. 4-7, 2019

Oral Presentations

- ❖ Presented papers in IMaRC 2019 (*1 paper*), UPCON 2019 (*1 paper*), APCAP 2019 (*2 papers*), IMaRC 2018 (*2 papers*), IMaRC 2016 (*1 paper*)

Poster Presentations

- ❖ Presented papers in IMaRC 2019 (*Best Paper Competition*), APMC 2019 (*1 paper*)
- ❖ SIW cavity based compact RF sensor authored by P. K. Varshney and M. J. Akhtar
  EE Research Scholar's Day, IIT Kanpur 2017

DOCTORAL (PH.D.) THESES SUPERVISION

S. No.	Scholar Name	Thesis Title	Status (Year)	Co-supervisor (if any)
1	Rachna Prabha	SIW based displacement sensor	Ongoing	-
2	Ramnaresh Pal	Metamaterial inspired microwave sensor	Ongoing	-
3	Md. Bilal Arshad	-	Ongoing	-

MASTER'S (M.TECH.) THESES SUPERVISION

S. No.	Scholar Name	Thesis Title	Status (Year)	Co-supervisor (if any)
1	Bishal Gupta	Metamaterial based planar sensor for adulteration detection	Ongoing	-