

Curriculum Vitae

SOMEN BHATTACHARJEE

PhD (IIT Guwahati)

Phone: +91-9732080815

Email: b.somen@iitg.ernet.in, somen.aec@gmail.com

1 Personal Information

Name : Dr. Somen Bhattacharjee
Father's Name : Sanjib Kumar Bhattacharjee
Date of Birth : 08/11/1982
Marital Status : Married
Gender : Male
Category : UR
Citizenship : Indian
Permanent Address : C-42, Bhimpalashree Sarani, Sector - 2C, Bidhan-
nagar, Durgapur, Dist.-Burdwan, PIN-713212 West
Bengal, India.

2 Educational Qualifications

| Degree | Institute/Board | Specialization | CGPA/% | Year |
|--------|--------------------------------|----------------|--------|------|
| Ph.D. | IIT Guwahati | RF & Microwave | - | 2016 |
| M.Tech | NIT Durgapur | Telecomm Engg | 8.63 | 2010 |
| B.Tech | Asansol Engg College (WBUT) | ECE | 7.49 | 2006 |

3 Experiences

- Assistant Professor (Contractual), Techno India University, Kolkata
(4th May, 2017 – Till Date)
 - Microwave Engineering Theory & Laboratory (Undergraduate Level)

- Signal & System Theory (Undergraduate Level)
- Basic Electrical & Electronics Engineering Theory & Laboratory(Undergraduate Level)
- Microwave Devices & Communication Theory (Postgraduate Level)
- Teaching assistant for the following courses, IIT Guwahati (December 2010 – December 2014)
 - Basic Electronics Laboratory (Undergraduate Level)
 - Microwave Engg Laboratory (Undergraduate Level)
- Assistant Professor, NSHM Knowledge Campus, Durgapur (3rd August, 2010 – 17th December, 2011)
 - Basic Electronics Theory & Laboratory (Undergraduate Level)
 - Signal & System Theory & Laboratory (Undergraduate Level)

4 Awards and Achievements

- Awarded institute scholarship for PhD, IIT Guwahati (2011–2016)
- Awarded Ministry of Human Resource Development (MHRD) scholarship for M.Tech, NIT Durgapur (2008–2010)
- Qualified Graduate Aptitude Test in Engineering (GATE 2008)

5 Research Interests

- Research interests include Electromagnetic Field Theory, Antennas, Microwave and Numerical Electromagnetics
- Some specific keywords of areas of interest are: Antennas in Layered Media, Anisotropic material filled Waveguide, Performance of Antenna in Double Negative Metamaterial

6 Review Boards

- Reviewer of International Journal of Electronics and Communication (Elsevier)
- Reviewer of Applied Computational Electromagnetics Society Journal

- Reviewer of International Journal of Ultra Wideband Communications and Systems
- SPCOM 2016 (Biennial Conference organized by IISc, Bangalore)

7 Skills

- Operating platform: Windows
- Computational tools: MATLAB and Mathematica
- Editing tools: MS office and LaTeX
- Electromagnetic Software: HFSS, CST Microwave Studio
- Electromagnetic Hardware: Vector Network Analyzer

8 Talks and Presentations

- Presented a paper titled “Bandwidth enhancement of Printed Monopole Antennas using Magneto-dielectric cover” in IEEE Applied Electro Magnetic Conference (AEMC), at IIT Guwahati, December 2015.
- Presented a paper titled “Performance of Linear Arrays with Travelling Wave Current Distribution” in IEEE International Conference on Devices and Communications (ICDeCom-11), at Birla Institute of Technology, Mesra, Ranchi, February 2011.
- Presented a paper titled “An Exact Solution of Electromagnetic Field in Far Zone Radiated by Contra Wound Toroidal Helical Antenna” in IEEE IEEE International Conference on Recent Trends in Information, Telecommunication and Computing, (ITC-2010), Kochi, Kerala, March, 2010.

9 Committee Member

- Technical Program Committee in 3rd Annual International Workshop on Material Science & Engineering September 8-10, 2017, Guangzhou, Guangdong, China.
- Technical Program Committee in 5th Annual International Conference on Material Science and Engineering (ICMSE2017) June 23-25, 2017, Suzhou, Jiangsu, China.
- Sponsorship Committee in 1st International Conference on Emerging Trends in Computing, Communication and Control (ICETC3-2017), NSHM Knowledge Campus, Durgapur, India.

10 Seminars/Workshops Attended

- Attended short term course on “RF and Photonics: Fundamentals & Advances” at IIT Guwahati, 23–27 February, 2015.
- Attended “ANSYS Multiphysics Solution” at IIT Guwahati, 30 November, 2015.

11 PhD Thesis

- **Analysis of Printed Monopole Antennas** at IIT Guwahati
Supervisors: Dr. Rakesh Singh Kshetrimayum, Professor and Dr. Ratnajit Bhattacharjee, Professor

This research project is undertaken as a part of PhD degree. Abstract of PhD thesis is attached at the end of this CV.

12 Publications

Journals

1. **S. Bhattacharjee**, R. S. Kshetrimayum and R. Bhattacharjee, “On the equivalent circuit, input impedance, reflection coefficient and bandwidth of printed monopole antenna,” *Microwave and Optical Technology Letter, Wiley*, 57 (7), pp. 1535–1538, 2015
2. **S. Bhattacharjee**, R. S. Kshetrimayum and R. Bhattacharjee, “Derivation of potential Green functions for ungrounded dielectric slab and its application in full wave analysis of PMAs,” *Journal of Electromagnetic Waves and Applications, Taylor & Francis*, 29 (16), pp. 2242–2256, 2015
3. **S. Bhattacharjee**, R. S. Kshetrimayum and R. Bhattacharjee, “Printed monopole antennas on uniaxial substrate: Theory and Simulation,” *Electronics Letters*, 52 (10), pp. 796–798, 2016
4. **S. Bhattacharjee**, R. S. Kshetrimayum and R. Bhattacharjee, “On the Theoretical Analysis of Radiation Pattern and Gain of Printed Monopole Antennas,” *Applied Computational Electromagnetics Society Journal*, 32 (9), pp. 842–847, 2017

Conferences

1. **S. Bhattacharjee**, R. S. Kshetrimayum and R. Bhattacharjee, “Bandwidth enhancement of Printed Monopole Antennas using Magneto-dielectric cover,” *IEEE*

Applied Electro Magnetic Conference (AEMC), 2015

2. **S. Bhattacharjee**, S. Das, D. Mandal, A. K. Bhattacharjee, "Performance of Linear Arrays with Travelling Wave Current Distribution," *IEEE International Conference on Devices and Communications (ICDeCom-11)*, 2011
3. **S. Bhattacharjee**, S. Das, and D. Mandal, "An Exact Solution of Electromagnetic Field in Far Zone Radiated by Contra Wound Toroidal Helical Antenna," *IEEE International Conference on Recent Trends in Information, Telecommunication and Computing, (ITC 10)*, 2010

References

1. **Dr. Rakesh Singh Kshetrimayum** (PhD Supervisor)
Professor
Department of Electronics and Electrical Engineering
Indian Institute of Technology Guwahati
Guwahati – 781039, India
Phone: +91-361-2582514
E-mail: krs@iitg.ernet.in
2. **Dr. Ratnajit Bhattacharjee**(PhD Supervisor)
Professor
Department of Electronics and Electrical Engineering
Indian Institute of Technology Guwahati
Guwahati – 781039, India
Phone: +91-361-2582503
E-mail: ratnajit.bhattacharjee@gmail.com, ratnajit@iitg.ernet.in
3. **Dr. Anup Kumar Gogoi** (Chairman, Doctoral Committee)
Professor
Department of Electronics and Electrical Engineering
Indian Institute of Technology Guwahati
Guwahati – 781039, India
Phone: +91-361-2582504
E-mail: akg@iitg.ernet.in

Abstract of PhD Thesis

Printed monopole antenna (PMA) is one of the most suitable antenna for achieving large bandwidth and omnidirectional radiation pattern. In the last one decade, several printed monopole antenna configurations have been proposed and such antennas have been designed using different simulation softwares (HFSS, IE3D, CST Microwave Studio etc) for various wireless communication applications such as wireless LAN, WiFi, UWB etc. However, very few theoretical works are reported for the analysis of printed monopole antennas. Our present work is devoted to development of analytical framework for investigation of printed monopole antennas. Full wave analysis using Mixed Potential Integral Equation is performed along with the derivation of spatial domain potential (scalar and vector) Greens function for horizontal electric dipole lying on an ungrounded dielectric layer. The input impedance and return loss of printed monopole antenna is calculated and validated by simulation (HFSS) and available experimental results. Approximate analysis of printed monopole antenna is also done to calculate input impedance using transmission line theory. In this, substrate is considered as a transmission line section terminated with free space characteristic impedance. The intrinsic impedance of the medium (substrate) depends on the thickness and the dielectric constant of the medium. Spectral domain Greens function for the field components is also derived in order to calculate the radiation pattern and gain of rectangular and circular printed monopole antenna and the theoretical results are validated by simulation (HFSS) and available experimental results. Next, the performance of printed monopole antenna with a magneto-dielectric cover and uniaxial substrate is investigated both in theory as well as in simulation (HFSS). Finally, appropriate circuit representation of printed monopole antenna is presented for different geometries of antenna and the ground planes, which are further, verified by simulation (HFSS) and available experimental results.