

GANESH B. KUMBHAR, PH.D.

Department of Electrical Engineering,
Indian Institute of Technology-Roorkee,
Roorkee, Uttarakhand- 247667, INDIA
Phone: +91 1332 28 4752

Email : gkumbfee@iitr.ac.in
dr.gbkumbhar@gmail.com
Mobile: +91 73518 63886
Web: <http://www.iitr.ac.in/departments/EE/pages/People+Faculty+gkumbfee.html>

EDUCATION

- **Ph. D., Electrical Engineering** July, 2007
Institute: Indian Institute of Technology-Bombay, Powai, Mumbai, India
Thesis: Application of coupled field formulations for analysis of intricate phenomena in transformers.
Adviser: Prof. S. V. Kulkarni
- **M. Tech., Electrical Engineering** January, 2002
Institute: Indian Institute of Technology-Madras, Chennai, India
Thesis: Experimental and theoretical studies on tracking phenomena in composite insulation materials.
Adviser: Prof. R. Sarathi
- **B. E., Electrical Engineering** June, 1999
Institute: Government College of Engineering, Karad, District: Satara, India
Title of Project: Comprehensive protective scheme for the laboratory type alternator.
Adviser: Prof. N. Gopalkrishnan

PROFESSIONAL EXPERIENCE

- **Assistant Professor:** Indian Institute of Technology-Roorkee, Roorkee, INDIA
 - June, 2011 – Till date
- **Deputy Manager:** Crompton Greaves, Ltd., Global R&D Center, Mumbai, INDIA
 - July, 2010–May, 2011
- **Assistant Professor:** Veermata Jijabai Technological Institute (VJTI), Mumbai, INDIA
 - October, 2009 – May, 2010
- **Post-Doctoral Research Scholar:** Tennessee Tech University, TN, USA.
 - October, 2008 – September, 2009
- **Assistant Consultant:** Tata Consultancy Services, Ltd., Mumbai, INDIA
 - January, 2008–October, 2008
- **Senior Engineer:** Eaton Industries Pvt. Ltd., Pune, INDIA
 - August, 2006–December, 2007

AWARDS AND ACHIEVEMENTS

- **Dr. Ing. Dieter Kind Prize**, for being the student with the best project from amongst the areas in High Voltage Engineering, Instrumentation and Measurement and Power Systems in Electrical Engineering Branch of M. Tech Degree course for the period 2000-2001, at IIT Madras.
- **IEEMA Best Paper Award**, for best paper at Seventh International Conference on Transformers, TRAFOTECH- 2006 held at Mumbai on 21-22, January, 2006.

PUBLICATIONS JOURNALS:

- [1] **G. B. Kumbhar**, S. V. Kulkarni, and V. S. Joshi, "Analysis of half-turn effect in power transformers using nonlinear-transient FE formulation," *IEEE Transactions on Power Delivery*, vol. 22, no. 1, pp. 195-200, Jan. 2007.
- [2] **G. B. Kumbhar** and S.V. Kulkarni, "Analysis of short circuit performance of split-winding transformer using coupled field-circuit approach," *IEEE Transactions on Power Delivery*, vol. 22, no. 2, pp. 936-943, Apr. 2007.
- [3] **G. B. Kumbhar** and Satish M. Mahajan, "Reduction of loss and local overheating in the tank of a current transformer," *IEEE Transactions on Power Delivery*, vol. 25, no. 4, pp. 2519–2525, Oct. 2010.
- [4] Mithun Mondal, **G.B. Kumbhar**, S. V. Kulkarni, Localization of Partial Discharges inside a Transformer Winding Using a Ladder Network Constructed From Terminal Measurements, *IEEE Transactions on Power Delivery*, vol. 33, issue 3, pp. 1035–1043, June. 2018.
- [5] Mithun Mondal and **G.B. Kumbhar**, "A technique based on an Archimedean copula for the localization of partial discharge in a transformer winding," *IEEE Transactions on Dielectrics and Electrical Insulation*, vol. 23, issue 5, pp. 2908–2916, Oct. 2016.
- [6] Thirumurugan Chandrasekaran, **G.B. Kumbhar**, and Ramesh Oruganti, "Effects of Impurities on surface discharges at synthetic-ester/cellulose board," *IEEE Transactions on Dielectrics and Electrical Insulation*, Accepted for publication, 2018.
- [7] Saran Satsangi and **G.B. Kumbhar**, "Effect of Load Models on Scheduling of Volt/VAr Control Devices in a Distribution Network," *IET Generation, Transmission & Distribution*, Accepted for publication, DOI: 10.1049/iet-gtd.2018.5262 , Online ISSN 1751-8695 2018.
- [8] **G. B. Kumbhar** and Satish M. Mahajan, "Analysis of Short Circuit and Inrush Transients in a Current Transformer using a Field-Circuit Coupled FE Formulation," *International Journal of Electrical Power and Energy Systems (IJPES)*, vol. 33, no. 8, pp.1361-1367, Oct. 2011.
- [9] R. S. Bhide, **G. B. Kumbhar**, S. V. Kulkarni, and J. P. Koria, "Coupled circuit-field formulation for analysis of parallel operation of converters with interphase transformer," *Electric Power Systems Research (EPSR)*, vol. 78, no. 1, pp. 158-164, Jan. 2008.
- [10] Sandeep Kaur, **G. B. Kumbhar**, and Jaydev Sharma, "A MINLP Technique for optimal placement of Multiple DG units in Distribution systems," *International Journal of Electrical Power and Energy Systems (IJPES)*, vol. 63, pp. 609–617, Dec. 2014.
- [11] Mithun Mondal and **G. B. Kumbhar**, "Generalized Analytical Formulae to Compute Electrical Characteristics of a Homogenous Ladder Network of the Transformer Winding," *International Journal of Circuit Theory and Applications*, vol. 46, no. 4, pp. 911-925, April 2018.
- [12] Saran Satsangi and **G.B. Kumbhar**, "Integrated Volt-VAr Optimization with Distributed Energy Sources to Minimize Substation Energy in Distribution System," *Electric Power Components and Systems*, Accepted for publication, 2018.
- [13] Kanhaiya Kumar and **G.B. Kumbhar**, "Assessment of Effect of Load Models on Loss-of-Life Calculation of a Transformer Using a Point Estimation Method," *Electric Power Components and Systems*, Accepted for publication, 2018.

- [14] **G. B. Kumbhar**, S.V. Kulkarni, R. Escarela-Perez, and E. Campero-Littlewood, "Applications of coupled field formulations to electrical machinery," *The International Journal for Computation and Mathematics in Electrical and Electronic Engineering (COMPEL)*, vol. 26, no. 2, pp. 489-523, 2007.
- [15] **G. B. Kumbhar** and Satish M. Mahajan, "Detection of saturation, and reconstruction of the secondary current of a CT," *International Journal of Emerging Electric Power Systems (IJEPES)*, vol. 11, no. 1, 2010.
- [16] Sandeep Kaur and **G. B. Kumbhar**, "Incentive driven distributed generation planning with renewable energy resources," *Advances in Electrical and Computer Engineering*, vol. 14, no. 4, pp. 21-28, 2014.
- [17] M. Nabi, S. V. Kulkarni, A. K. Gupta, and **G. B. Kumbhar**, "An improved finite element computational scheme for transient field-circuit coupled systems," *International Journal of Computational Methods in Engineering Science and Mechanics*, vol. 7, no. 4, pp. 313-322, Jul.-Aug. 2006.
- [18] Mithun Mondal and **G.B. Kumbhar**, "Partial discharge localization in a power transformer: methods, trends, and future research," *IETE Technical Review (Taylor & Francis)*, DOI:10.1080/02564602.2016.1209436, Aug 2016.
- [19] Mithun Mondal and **G.B. Kumbhar**, "Detection, measurement, and classification of partial discharge in a power transformer: methods, trends and future research," *IETE Technical Review (Taylor & Francis)*, doi: 10.1080/02564602.2017.1335244, June 2017.
- [20] Kanhaiya Kumar, Saran Satsangi, and **G.B. Kumbhar**, "Extension of Life of a Distribution Transformer using Volt-VAR Optimization in a Distribution System," *IET Generation, Transmission & Distribution*, Accepted for publication, 2019.

PUBLICATIONS CONFERENCES

- [1] **G. B. Kumbhar** and S. V. Kulkarni, "Analysis of sympathetic inrush phenomena in transformers using coupled field-circuit approach," *Proceedings IEEE PES General Meeting*, Tampa, USA, 24-28, June 2007.
- [2] **G. B. Kumbhar** and Satish Mahajan, "Field-circuit coupled formulation of transient phenomena in current transformers," *Proceedings IEEE PES General Meeting*, Calgary, Alberta, Canada, 26-30, July 2009.
- [3] **G. B. Kumbhar** and S. V. Kulkarni, "Applications of coupled field formulations to power system engineering," *Proceedings International Conference on Power Systems (ICPS 2004)*, Kathmandu, Nepal, , pp. 599-503, 3-5, Nov. 2004.
- [4] **G. B. Kumbhar** and S. V. Kulkarni, "A directly coupled field-circuit model of a transformer to study surge phenomena and for frequency response analysis", *Proceedings National Power System Conference, NPSC-2014*, Guwahati, 18-20, Dec. 2014.
- [5] **G. B. Kumbhar** and Satish Mahajan, "Effect of a Distribution of Primary Winding on the Short-Circuit Forces of a Current Transformer," *The 5th International Conference on Electrical Energy and Networks, Singapore*, March 25-27, 2017, Accepted for presentation.
- [6] **G. B. Kumbhar** and Satish Mahajan, Effect of a Distribution of Primary Winding on the Short-Circuit Forces of a Current Transformer, *Proceedings The 5th International Conference on Electrical Energy and Networks, Singapore*, March 25-27, 2017.

- [7] Kanhaiya Kumar, **G. B. Kumbhar** and Satish Mahajan, "A new efficient algorithm to detect Current Transformer saturation," *Proceedings IEEE PES General Meeting*, Boston, USA, 17-21, July 2016.
- [8] S. V. Kulkarni, **G. B. Kumbhar**, and M. Nabi, "Current trends in coupled field formulations in electrical machinery," *Proceedings 6th International Symposium on Electric and Magnetic Fields*, Aachen, Germany, pp. 287-291, 6-9, Oct. 2003.
- [9] S. Kumar, **G. B. Kumbhar**, S. V. Kulkarni, R. P. R. C. Aiyar, and S. V. Desai, "Electromagnetic forming: A case study of coupled magneto-mechanical formulation," *Proceedings XII International Symposium on Electromagnetic Fields in Mechatronics, Electrical and Electronic Engineering (ISEF 2005)*, Baiona, Spain, Paper No. EE-2.22, 15-17, Sept. 2005.
- [10] Sandeep Kaur, **G. B. Kumbhar**, and Jaydev Sharma, "Performance of Mixed Integer Non-linear Programming and Improved Harmony Search for Optimal Placement of DG Units", *Proceedings IEEE PES General Meeting, National Harbour*, MD, USA, 27-31, July 2014.
- [11] S. Verma, **G. B. Kumbhar**, and S. V. Kulkarni, "Coupled circuit-field formulation for analysis of parallel operation of converters with interphase transformer," *Proceedings International Conference on Computer Applications in Electrical Engineering - Recent Advances*, Roorkee, pp. 279-282, Sep. 29 - Oct. 1, 2005.
- [12] S. V. Kulkarni, **G. B. Kumbhar**, Ashish Gupta, and Sourabh Varma, "Applications of field-circuit coupled formulations for reliability enhancement of transformers," *Proceedings Seventh International Conference on Transformers (TRAFOTECH-2006)*, pp. II.10-II.26, , Mumbai, 21-22, Jan. 2006.
- [13] A. V. Kank, **G. B. Kumbhar**, and S.V. Kulkarni, "Coupled magneto-mechanical field computations," *Proceedings International Conference on Power Electronics Drives and Energy Systems for Industrial Growth, PEDES 2006*, IIT Delhi, , Delhi, 12-15, Dec. 2006.
- [14] Sandeep Kaur, **G. B. Kumbhar**, and Jaydev Sharma, "Harmony Search and OPF based hybrid approach for optimal placement of multiple DG units" *Proceedings National Power System Conference*, NPSC-2014, Guwahati, 18-20, Dec.2014.
- [15] Mithun Mondal, C. Thirumurugan, **G. B. Kumbhar**, "Research on Surface Discharge Phenomena on Oil-Pressboard Interface in Power Transformers," *Proceedings International Conference on High Voltage Engineering and Technology-2015*, Hyderabad, 29-30, Jan. 2015.
- [16] S. K. Joshi, H. O. Gupta, P. Agarwal, **G. B. Kumbhar**; "Field Investigations On Harmonic Pollution Affecting Transformers" *Proceedings 2nd International Colloquium –Transformer Research and Asset Management, Cigre, SC-A2*, Dubrovnik, Croatia, TLM09, pp1-10, 16-18, May 2012.
- [17] Mithun Mondal and **G. B. Kumbhar**, "A novel technique for partial discharge localization in transformer winding based on Archimedean copula," *Proceedings International Symposium on High Voltage Engineering (ISH2015)*, August 23 - 28, 2015, Pilsen, Czech Republic.
- [18] C. Thirumurugan, **G. B. Kumbhar**, and Ramesh Oruganti, "Effect of electrode configurations and gap spacings on PD characteristics of oil-pressboard," *Proceedings IEEE 11th International Conference on the Properties and Applications of Dielectric Materials (ICPADM)*, Sydney, Australia, 19-22 July, 2015.
- [19] Saran Satsangi and **G. B. Kumbhar**, "Effect of Load Models on Energy Loss Reduction using Volt-VAr Optimization," *Proceedings National Power System Conference*, NPSC-2016, Bhubhaneswar, 18-20, Dec.2016.

- [20] Saran Satsangi and **G. B. Kumbhar**, "Review on Volt/VAr Optimization and Control in Electric Distribution System," *Proceedings IEEE 1st International Conference on Power Electronics, Intelligent Control and Energy Systems, ICPEICES 2016*, New Delhi, 4-6, July 2016.
- [21] Saran Satsangi and **G. B. Kumbhar**, "Analysis of Substation Energy using Conservation Voltage Reduction in Distribution System," *Proceedings IEEE International Conference on "Electrical Power and Energy Systems, ICEPES 2016*, Bhopal, 14-16, Dec 2016.
- [22] C.Thirumurugan, **G.B.Kumbhar**, and R.Oruganti, " Partial discharges characteristics of oil-pressboard insulation: Effect of moisture", *Proceedings IEEE International Conference on Power Modular and High Voltage (IPMHVC'16)*, San Francisco, CA, USA, 5-9 July 2016.
- [23] C.Thirumurugan, **G.B.Kumbhar**, and R.Oruganti, "Partial discharge studies on synthetic ester pressboard insulation: Effect of conducting particles", *Proceedings National Conference on Recent Trends in Power Engineering (NPERSM'15)*, Madras, India, 29-30 December, 2015.
- [24] Badopant Pawar, Sandeep Kaur and **G. B. Kumbhar**, "An integrated approach for power loss reduction in primary distribution system," *Proceedings IEEE 6th International Conference on Power Systems (ICPS)*, New Delhi, 4-6 March 2016
- [25] C.Thirumurugan, **G. B. Kumbhar**, R. Oruganti, "Partial discharge studies on synthetic esterpressboard insulation: Effect of conducting particles", *Proceedings Innovative session, Indo-Swedish Colloquium on Electrotechnical (ISC'15)*, Madras, India, 3-5 December 2015.
- [26] Mithun Mondal and **G.B. Kumbhar**, "A generalized algorithm to compute response of partial discharge in a transformer winding using its equivalent ladder network," *Proceedings 3rd International Conference on Condition Assessment Techniques in Electrical Systems (CATCON)*, IIT Ropar, 16-18 Oct, 2017
- [27] Kanhaiya Kumar and **G.B. Kumbhar**, " A Review on Impact of Distributed Generation and Electrical Vehicles on Aging of Distribution Transformer," *Proceedings 3rd International Conference on Condition Assessment Techniques in Electrical Systems (CATCON)*, IIT Ropar, 16-18 Oct, 2017.
- [28] Sukhlal Sisodiya and **G.B. Kumbhar**, "A Novel Algorithm for Scheduling of a House Loads incorporating PV System with Utility using PSO," *Proceedings IEEE International Conference on Power Energy, Environment and Intelligent Control*, Noida, 13-14 Apr., 2018.
- [29] Sukhlal Sisodiya and **G.B. Kumbhar**, "Demand Side Resources for Electric Energy Management," *Proceedings 4th International Conference on Electrical Energy Systems*, Kalavakkam, Tamilnadu, India, 07-09 Feb., 2018.

REFERENCES

- **Prof. S. V. Kulkarni**
Professor, Department of Electrical Engineering,
Indian Institute of Technology, Bombay, Powai, Mumbai-76, INDIA
Phone: +91-22-25767430
E-mail: svk@ee.iitb.ac.in
- **Prof. Satish M. Mahajan**
Professor, Department of Electrical and Computer Engineering
Tennessee Technological University, Cookeville, TN-38505, USA
Phone: +1-931-372-3760
E-mail: smahajan@tntech.edu
- **Prof. S. A. Khaparde**
Professor, Department of Electrical Engineering,
Indian Institute of Technology, Bombay, Powai, Mumbai-76, INDIA
Phone: +91-22-25767434
E-mail: sak@ee.iitb.ac.in