



Colegio de San Juan de Letran
Dominican Avenue, Abucay, Bataan
Library and Media Services

RESEARCH GUIDE: ELECTROMAGNETICS

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RESEARCH GUIDES

ELECTROMAGNETICS

I. SCOPE NOTE

Electromagnetics involves the study of Maxwell's equations and their application to the analysis and design of devices and system. ece.gatech.edu

II. SEARCH AIDS (BT: Broader Term, RT: Related Term, NT: Narrow Term)

BT:

- Electronics

RT:

- Vector algebra
- Vector calculus
- Vector analysis
- Electric field
- Magnetic fields
- Resistive material
- Magnetic material
- Dielectric material
- Coupled circuits
- Magnetic circuits
- Time-varying electromagnetic field
- Maxwell's equations
- Transmission lines

NT:

- Vector product
- Calculus of vectors
- Vector identities
- Vector functions
- Directional derivative
- Gradient
- Divergence
- Curl
- Integral theorems
- Green's lemma
- Stroke's theorem
- Conductor
- Line inductance
- Line capacitance
- Shunt conductance

- Voltage regulation
- Magnetic flux
- Magnetic force
- Vector field
- Field lines
- Electrostatic field

III. INFORMATION RESOURCES

A. LIBRARY RESOURCES

Note: For the appropriate access credentials, please contact the Letran Bataan Library

➤ E-JOURNALS

- IEEE Antennas & Propagation Magazine.
https://www.proquest.com/central/publication/publications_85447
- IEEE Microwave Magazine.
https://www.proquest.com/central/publication/publications_75738
- Compel. https://www.proquest.com/central/publication/publications_31712
- Electronics Letters.
https://www.proquest.com/central/publication/publications_1936364
- Frontiers of Information Technology & Electronic Engineering.
https://search.proquest.com/central/publication/publications_2044401
- IET Science, Measurement & Technology.
https://search.proquest.com/central/publication/publications_1916346
- Microwave Journal, International Edition.
https://search.proquest.com/central/publication/publications_6366
- Journal of Engineering Education.
https://search.proquest.com/central/publication/publications_42405
- IEEE Antennas & Propagation Magazine.
https://search.proquest.com/central/publication/publications_85447

➤ E-THESES

- Stoneback, R. A. (2009). Applications of the electromagnetic helmholtz resonator* (Order No. 3373956). Available from ProQuest Central. (305065386). Retrieved from <https://www.proquest.com/dissertations-theses/applications-electromagnetic-helmholtz-resonator/docview/305065386/se-2?accountid=190548>
- Wang, D. (2020). Electric power grid resilience against electromagnetic pulse (EMP) disturbances (Order No. 27956165). Available from ProQuest Central. (2404049181). Retrieved from <https://www.proquest.com/dissertations-theses/electric-power-grid-resilience-against/docview/2404049181/se-2?accountid=190548>
- Singhal, K. (2018). Analysis of metallic shielding for reduction of RF induced heating of electrode during MRI for active implants (Order No. 10844963). Available from ProQuest Central. (2112369841). Retrieved from <https://www.proquest.com/dissertations->

[theses/analysis-metallic-shielding-reduction-rf-induced/docview/2112369841/se-2?accountid=190548](https://www.proquest.com/dissertations-theses/analysis-metallic-shielding-reduction-rf-induced/docview/2112369841/se-2?accountid=190548)

- Beer, C. P. (2010). How do pre-service teachers picture various electromagnetic phenomenon? A qualitative study of pre-service teachers' conceptual understanding of fundamental electromagnetic interaction (Order No. 3438756). Available from ProQuest Central. (848966636). Retrieved from <https://www.proquest.com/dissertations-theses/how-do-pre-service-teachers-picture-various/docview/848966636/se-2?accountid=190548>
- Knaak, A. (2015). 3D synthetic aperture for controlled-source electromagnetics (Order No. 3682006). Available from ProQuest Central. (1656486957). Retrieved from <https://search.proquest.com/docview/1656486957?accountid=190548>
- Kohnke, C. J. (2017). Electromagnetic effects of steel-cased wells (Order No. 10254924). Available from ProQuest Central. (1871306238). Retrieved from <https://search.proquest.com/docview/1871306238?accountid=190548>
- Cerjanic, A. M. (2012). Method of moments modeling of single layer microstrip patch antennas using GPU acceleration and quasi-monte carlo integration (Order No. 1532357). Available from ProQuest Central. (1285524188). Retrieved from <https://search.proquest.com/docview/1285524188?accountid=190548>
- Grefe, S. E. (2013). Plasmonic and topological insulator nanostructures and metamaterials nanoscale near-field investigations: Experiment and theory (Order No. 1527377). Available from ProQuest Central. (1509495160). Retrieved from <https://search.proquest.com/docview/1509495160?accountid=190548>
- Kim, C. (2016). Wave chaos and enhancement of coherent radiation with rippled waveguides in a photoconductive antenna (Order No. 10245282). Available from ProQuest Central. (1858815519). Retrieved from <https://search.proquest.com/docview/1858815519?accountid=190548>

B. OPEN ACCESS

➤ FREE E-BOOKS

- Electromagnetics Vol 1. <https://open.umn.edu/opentextbooks/textbooks/532>
- Ishimaru, Akira. (2017). Electromagnetic Wave Propagation, Radiation, And Scattering from Fundamentals to Applications, 2nd edition. New Jersey: John Wiley & Sons. <https://www.pdfdrive.com/electromagnetic-wave-propagation-radiation-andscattering-from-fundamentals-to-applications-ieee-press-series-on-electromagneticwave-theory-d158423714.html>
- Stratton, Julius Adams. (2007). Electromagnetic Theory. New York: IEEE Press. <https://www.pdfdrive.com/electromagnetic-theory-ieee-press-series-onelectromagnetic-wave-theory-d156997009.html>
- Sevgi, Levent. (2003). Complex Electromagnetic Problems and Numerical Simulation Approaches. New Jersey: John Wiley & Sons, Inc. <https://www.pdfdrive.com/complexelectromagnetic-problems-and-numerical-simulation-approaches-ieee-press-series-onelectromagnetic-wave-theory-d162093744.html>

- Zahn, Marcus. (2008). ELECTROMAGNETIC FIELD THEORY: a problem solving approach. Massachusetts Institute of Technology. <https://www.pdfdrive.com/electromagneticfield-theory-a-problem-solving-approach-d19502339.html>

➤ FREE E-JOURNALS

- Journal of Electromagnetic Analysis and Applications. <https://www.scirp.org/journal/journalarticles.aspx?journalid=29>
- International Journal of Magnetics and Electromagnetism. <https://vibgyorpublishers.org/journals/International-Journal-of-Magnetics-and-Electromagnetism.php>
- International Journal of Applied Electromagnetics and Mechanics - Volume Pre-press, issue Pre-press. <https://content.iospress.com/journals/international-journal-of-applied-electromagnetics-and-mechanics/Pre-press/Pre-press>
- International Journal of Electromagnetics & Applications. <http://www.sapub.org/journal/aimsandscope.aspx?journalid=1080>
- American Journal of Electromagnetics & Applications. <http://www.sciencepublishinggroup.com/journal/index?journalid=225>
- Advanced Electromagnetics. <https://aemjournal.org/index.php/AEM>
- Journal of Electromagnetics Waves & Applications. <https://brill.com/view/journals/jew/jew-overview.xml>
- Electronics – Open Access Journal. <https://www.mdpi.com/journal/electronics>

➤ FREE E-THESES

- Hellicar., A. D. (2021). Geometric scalar and equivalent current vector basis function representations in boundary element methods for computational electromagnetics. (Thesis). Monash University. Retrieved from <https://doi.org/10.26180/14966892.v1>
- Kumar, C. (2015). Modelling intermittent microwave convective drying (IMCD) of food materials. (Thesis). Queensland University of Technology. Retrieved from <http://eprints.qut.edu.au/85437/>
- Lonsbury, C. (2016). QUASI-MAGNETOSTATIC FIELD MODELING OF SHIPS IN THE PRESENCE OF DYNAMIC SEA WAVES. (Masters Thesis). University of Kentucky. Retrieved from https://uknowledge.uky.edu/ece_etds/85
- Chang, C. K. (2017). SPARSE DIRECT SOLUTION METHODS FOR CAPACITIVE EXTRACTION PROBLEMS ON CLOSELY SPACED GEOMETRIES WITH HIGH ASPECT RATIOS. (Masters Thesis). University of Kentucky. Retrieved from https://uknowledge.uky.edu/ece_etds/108
- Ley-Cooper., A. Y. (2021). Calibration of airborne electromagnetic data with applications to salinity and environmental studies. (Thesis). Monash University. Retrieved from <https://doi.org/10.26180/14969010.v1>
- Inman, M. J. (2013). Graphics Processing Unit Acceleration Of Computational Electromagnetic Methods. (Doctoral Dissertation). University of Mississippi. Retrieved from <https://egrove.olemiss.edu/etd/528>

- Nakatsu, J. S. K. (2016). Genetic programming applications in electromagnetics. (Thesis). University of Hawaii – Manoa. Retrieved from <http://hdl.handle.net/10125/101315>
- Abdussalam, F. M. A. (2018). Antenna design using optimization techniques over various computational electromagnetics: antenna design structures using genetic algorithm, Particle Swarm and Firefly algorithms optimization methods applied on several electromagnetics numerical solutions and applications including antenna measurements and comparisons. (Doctoral Dissertation). University of Bradford. Retrieved from <http://hdl.handle.net/10454/17217>
- Brockett, T. J. (2013). 1D, 2D, and 3D Periodic Structures: Electromagnetic Characterization, Design, and Measurement. (Thesis). UCLA. Retrieved from <http://www.escholarship.org/uc/item/5c20p150>
- Koudelka, V. (2018). Pravděpodobnostní neuronové sítě pro speciální úlohy v elektromagnetismu: Probabilistic Neural Networks for Special Tasks in Electromagnetics. (Thesis). Brno University of Technology. Retrieved from <http://hdl.handle.net/11012/28242>
- Johnson, Buxton L., S. (2017). HYBRID PARALLELIZATION OF THE NASA GEMINI ELECTROMAGNETIC MODELING TOOL. (Masters Thesis). University of Kentucky. Retrieved from https://uknowledge.uky.edu/ece_etds/99
- Hänninen, J. J. (2004). Solving Electromagnetic Boundary Problems with Equivalence Methods. (Thesis). Helsinki University of Technology. Retrieved from <http://lib.tkk.fi/Diss/2004/isbn9512270811/>
- Klopff, E. M. (2011). Optimal higher order modeling methodology based on method of moments and finite element method for electromagnetics. (Doctoral Dissertation). Colorado State University. Retrieved from <http://hdl.handle.net/10217/70447>
- Wilkerson, O. T. (2019). Fast, Sparse Matrix Factorization and Matrix Algebra via Random Sampling for Integral Equation Formulations in Electromagnetics. (Masters Thesis). University of Kentucky. Retrieved from https://uknowledge.uky.edu/ece_etds/147
- Alkhateeb, O. (2018). DATA-DRIVEN UNCERTAINTY QUANTIFICATION IN APPLICATIONS OF ELECTROMAGNETICS AND WIRELESS COMMUNICATION VIA ARBITRARY POLYNOMIAL CHAOS. (Doctoral Dissertation). University of Akron. Retrieved from http://rave.ohiolink.edu/etdc/view?acc_num=akron1509988525627307
- Pfeiffer, R. (2015). Constrained Divergence-Conforming Basis Functions For Method Of Moments Discretizations In Electromagnetics. (Master's Thesis). University of Kentucky. Retrieved from http://uknowledge.uky.edu/ece_etds/79
- Aldhafeeri, A. (2018). Brain Storm Optimization for Electromagnetic Applications. (Thesis). UCLA. Retrieved from <http://www.escholarship.org/uc/item/4525h7p1>
- Connor, D. (2012). The Discontinuous Galerkin Method Applied to Problems in Electromagnetism. (Thesis). University of Waterloo. Retrieved from <http://hdl.handle.net/10012/6627>
- Smull, A. P. (2017). Conformal perfectly matched layer for electrically large curvilinear higher order finite element methods in electromagnetics. (Master's Thesis). Colorado State University. Retrieved from <http://hdl.handle.net/10217/184021>
- Donohoe, L. E. (2016). Developments in the Teaching of Engineering Electromagnetics for Improvement in Student Interest and Understanding. (Master's Thesis). Penn State University. Retrieved from <https://etda.libraries.psu.edu/catalog/28734>

C. PROFESSIONAL ORGANIZATIONS

- The IEEE Electromagnetic Compatibility Society. <https://www.emcs.org/>
- IEEE (Institution of Electrical and Electronics Engineers). <https://www.ieee.org/>
- IET (Institution of Engineering and Technology). <https://www.theiet.org/>
- (SPIE) International Society for Optics and Photonics. <https://spie.org/>
- ACM (Association for Computing Machinery). <https://www.acm.org/>
- EPRI (Electric Power Research Institute). <https://www.epri.com/>
- The Electromagnetic Academy. <http://emacademy.org/>
- The Applied Electromagnetic Society. <https://aces-society.org/history.php>
- INARTE. <https://inarte.org/>
- Institution of Electrical & Electronics Engineer. <https://www.ieee.org/>
- The Institution of Engineering & Technology. <https://www.theiet.org/>

D. OTHER RELATED WEB PORTALS

- Electromagnetism. <https://www.britannica.com/science/electromagnetism>
- Introduction to the Electromagnetic Spectrum. https://science.nasa.gov/ems/01_intro
- The Electromagnetic Spectrum Video Series & Companion Book. <https://science.nasa.gov/ems>
- Electric & Magnetic Fields. <https://www.niehs.nih.gov/health/topics/agents/emf/index.cfm>
- Electric and Magnetic Fields from Power Lines. <https://www.epa.gov/radtown/electric-and-magnetic-fields-power-lines>
- The European Space Agency. https://www.esa.int/Enabling_Support/Space_Engineering_Technology/Electromagnetics_and_Space_Environment
- NASA Science. https://science.nasa.gov/ems/01_intro
- National Institute of Environmental Health Sciences <https://www.niehs.nih.gov/health/topics/agents/emf/index.cfm>
- Waves. <https://physics.info/em-waves/>

E. RELATED RESEARCH GUIDES

- University of Arkansas. <https://uark.libguides.com/c.php?g=78850&p=505535>
- Ohio Northern University. <https://library.onu.edu/electromagnetics>
- Virginia Tech. <https://vtechworks.lib.vt.edu/handle/10919/84164>
- Bloomsburg University. <https://guides.library.bloomu.edu/physics>
- UNC Charlotte. <https://guides.library.uncc.edu/c.php?g=173148&p=1142992>

IV. TUTORIALS

- Magnetism and Electromagnetism Tutorial. <https://www.youtube.com/watch?v=V-Gus-qIT74>
- Electromagnetics Tutorial 2. <https://www.youtube.com/watch?v=maPYUNLhWlc>
- Electro Magnetics Theory - Wave Equation. <https://www.youtube.com/watch?v=QA1DHIJZTeE>
- Electromagnetic Waves Contents. <https://www.youtube.com/watch?v=owJaZNSEuYw>
- Electromagnetism Video Tutorial Part 1 @ www.ThePhysicsCafe.com
<https://www.youtube.com/watch?v=RVjnoCu10vc>
- Electromagnetism Video Tutorial Part 2 @ www.ThePhysicsCafe.com

- <https://www.youtube.com/watch?v=6WgC1MRxBBc>
- Electricity, Magnetism, & Electromagnetism Tutorial. <https://www.sciencebuddies.org/science-fair-projects/references/electricity-magnetism-electromagnetism-tutorial>
 - Electromagnetic Waves Source. <https://www.youtube.com/watch?v=O2sz0VYqs-o>
 - Electro Magnetics - Boundary Condition. <https://www.youtube.com/watch?v=rLbUbO59Qsk>
 - Free Online Electromagnetism Tutorials. <https://www.wiziq.com/tutorials/electromagnetism>
 - Electromagnetics. <https://www.antenna-theory.com/tutorial/electromagnetics/introduction.php>
 - Electromagnetism (6). <https://www.electronics-tutorials.ws/category/electromagnetism>
 - Electromagnetism. <https://www.electronics-tutorials.ws/electromagnetism/electromagnetism.html>
 - WIZ IQ. <https://www.wiziq.com/tutorials/electromagnetic-theory>
 - Tutorials Point. https://www.tutorialspoint.com/electromagnetics_theory/index.asp
 - Antenna Theory. <http://www.antenna-theory.com/tutorial/electromagnetics/introduction.php>
 - Sophia. <https://www.sophia.org/tutorials/electromagnetic-waves>

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