

Electrical Engineering Publication – Calendar Year 2012

Publications

I. Books

Published

Gardner, J., **V. K. Varadan** and O. Awadelkarim, *Microsensors, MEMS and Smart Devices*, (in Korean), John Wiley, 2011.

Manasreh, O., “*Introduction to Nanomaterials and Devices*,” John Wiley, appeared in November 2011. (466 pages).

Varadan, V. K., P. S. Kumar, *Wearable nanosensor architecture with smart phone for cardiac monitoring*, Global Scientific Publishing, 2011.

Varadan, V.K. (Editor), *Nanosensors, Biosensors and Info-Tech Sensors and Systems*, SPIE Publishing, Bellingham, Washington, 2011.

Varadan, V.V., “Professor Pao’s Influence on Research in Coupled Field Problems, Chirality and Acoustic and Electromagnetic Metamaterials and Their Applications”, Chapter 12, *From Waves in Complex Systems to Dynamics of Generalized Continua --Tributes to Professor Yih-Hsing Pao on his 80th Birthday*; World Scientific Publishing Company Pte Ltd., 2011.

Completed, Accepted and Awaiting Publication

Cressler, J.D., **H. A. Mantooth**, *Extreme Environment Electronics*, CRC Press, Boca Raton, FL, ~ 1000 pgs., submitted and in production, 2012.

Varadan, V.K., and L. F. Chen, *Functionalized magnetic nanomaterials for nanomedicine applications*, John Wiley, in press.

Varadan, V.K., *Neuroelectronics and Neurosurgery*, John Wiley, in press.

Varadan, V.K., *Polymer Microsensors and MEMS for Biomedical Applications*, John Wiley, in press.

Varadan, V.K., and L. F. Chen, *Nanodevices and systems in Engineering and Medicine*, John Wiley, accepted.

Wilson, P.R., **H. A. Mantooth**, *Model Based Engineering: A Design Approach for Complex Systems*, Elsevier Publishers, 600 pgs., submitted and in production, 2012.

II. Chapters

None

III. Refereed Articles

Ang, S. S., T. Evans, J. Zhou, K. Schirmer, H. Zhang, B. Rowden, J. Balda and A. Mantooth, "Packaging Issues for High-Voltage Power Electronic Modules," *Electrochemical Society (ECS) Transactions*, vol. 34, pp. 893-898, March 21, 2011, 2011.

Ang, S. S., T. Evans, J. Zhou, K. Schirmer, H. Zhang, B. Rowden, J. C. Balda, and H. A. Mantooth, "Packaging issues for high-voltage power electronic modules," *Electrochemical Society (ECS) Transactions – CSTIC 2011*, pp. 893-898, February 2011.

Arash, B., Q. Wang and **V. K. Varadan**, "Carbon nanotube based sensors for detection of gas atoms," *Journal of Nanotechnology in Engineering and Medicine*, 1. pp. 021010-1, 021010-4, 2011.

Barnes, A., S. Geurin, **J.C. Balda**, "Optimal Battery Chemistry, Capacity, Charge/Discharge Schedule, and Lifetime for Energy Storage under Time-of-Use Pricing", *IEEE-PES ISGT Europe 2011*, Manchester (UK), 5-7 December 2011.

Chen, L., J. Xie, K. R. Aatre, J. Yancey, S. Chetan, M. Srivatsan and **V. K. Varadan**, "Synthesis of hematite and maghemite nanotube and study of their applications in neuroscience and drug delivery," *Nanosensors, Biosensors and Info-Tech Sensors and Systems*, SPIE v.7980, 2011.

Chen, Z., A. Grekov, E. Santi, J. Hudgins, **H. A. Mantooth**, D. Sheridan, J. Casady, "Model for Power SiC Vertical JFET with Unified Description of Linear and Saturation Operating Regimes," *IEEE Trans. On Industry Applications*, vol. 47, no. 4, pp. 1853-1861, July-Aug. 2011.

Collins W., D. Sanchez, Z. Sharp, **S. C. Smith**, and J. Wu, "Developing a remote digital wildlife camera triggered by spatially deployed Infrared Sensors," in *Proc. International Conference on Embedded Systems and Applications (ESA'11)*, July 2011. pp 21-28.

Decrossas, E., M.A. EL Sabbagh, **Hameed Naseem**, V. Fouad Hanna and S.M. El-Ghazaly, "Effective Permittivity Extraction of Dielectric Nano-powder and Nano-composite Materials: Effects of Packing Densities and Mixture Compositions" in *Proceedings of the 41st European Microwave Conference*, Manchester, UK, October 10-13, 2011, pp. 956-959.

Ding, D., S. R. Johnson, **S.-Q. Yu**, S.-N. Wu, and Y.-H. Zhang, "A Semi-Analytical Model for Semiconductor Solar Cells," *J. Appl. Phys.*, 110, 123104 (2011).

El-Shenawee, M. and Ahmed Hassan, "How much is enough and can we image margins in breast cancer?," *The Proceedings of the 2011 Breast Cancer Challenge Conference*, Winthrop P. Rockefeller Cancer Institute, Big Cedar, MO, July 2011.

El-Shenawee, M., "Electromagnetic Imaging for Breast Cancer Research," *Proceedings of the IEEE Radio and Wireless Symposium: BioWireless*, Phoenix, Arizona, USA, January 16-19, pp. 55-58, 2011. (keynote speaker)

El-Shenawee, M., P. Blake, A. M. Hassan, and D. K. Roper, "Surface Plasmons of Finite Nanoring Arrays," *Proceedings of the IEEE International Symposium on Antennas and*

Propagation and USNC/URSI National Radio Science Meeting, Spokane, WA, USA, pp. 1609-1612, July 3-8, 2011.

Escobar, A., M. Saadeh, **J. C. Balda**, J. Bourne, Y. Feng, H. A. Mantooh, "A Methodology to Coordinate Solid-State Fault Current Limiters with Conventional Protective Devices," *IEEE PES Power Systems Conference & Exhibition, PSCE*, 6 pgs., Phoenix, Arizona, March 2011.

Fan, D., **S.-Q. Yu**, Z.M. Wang, S.R. Johnson and G. J. Salamo, "Novel GaInAsSbBi Materials for Mid-Infrared Type-I Quantum Well Lasers," *The Second International Workshop on Bismuth-Containing Semiconductors: Theory, Simulation and Experiment*, Guildford, UK, 18-20 July 2011.

Fan, D., Z. Zeng, V. G. Dorogan, Y. Hirono, C. Li, Y. I. Mazur, Z. M. Wang, S. R. Johnson, **S.Q., Yu**, G. J. Salamo, "Photoluminescence and Surface Morphology Characterization of GaAsBi Grown on GaAs," in *28th North American Molecular Beam Epitaxy Conference*, San Diego, 2011.

Fan, D., Z. Zeng, V. G. Dorogan, Y. Hirono, C. Li, Y. I. Mazur, Z. M. Wang, S. R. Johnson, **S.Q. Yu**, G. J. Salamo, "Bismuth surfactant mediated growth of InAs quantum dots by Molecular Beam Epitaxy," *MRS fall meeting 2011*, Boston.

Fu, G., **H. A. Mantooh**, J. Di, "A 12-bit CMOS current steering D/A converter with a fully differential voltage output," *12th International Symposium on Quality Electronic Design (ISQED)*, pp. 1-7, March 2011.

Fu, G., **H. A. Mantooh**, J. Di, "A New Topology for Fully Differential Amplifiers that Enhances Their Tolerance to External Disturbances," *Proc. of IEEE 9th International Conference on ASIC*, 4pgs, Xiamen, China, Oct. 2011.

Geng, X., D. Ma, Z. Chen, F. Dai, J. D. Cressler, J. A. Yaeger, M. M. Mojarradi, **H. A. Mantooh**, B. J. Blalock, R. W. Berger, "High Speed Channel Resistive Sensor Interface with RHBD in 0.5 μm SiGe BiCMOS for UWT from -180°C to 120°C," *IEEE BCTM 2011*, in review, 4 pgs., Oct. 2011.

Grekov, A., Z. Chen, R. Fu, J. L. Hudgins, **H. A. Mantooh**, D. C. Sheridan, J. Casady, and E. Santi, "Parameter extraction procedure for Vertical SiC Power JFET," *IEEE Trans. On Industry Applications*, vol. 47, no. 4, pp. 1862-1871, July-Aug. 2011.

Guo A.Q., C. Furrow, V. P. Kunets, **S.-Q. Yu**, G. Salamo, G. A. Sivoglou, R. El-Ganainy, K. G. Markris, D. N. Christodoulids, D. Duchesne, R. Morandotti, M. Volatier-Ravat, V. Aimez, "Observation of a Passive PT Phase Transition," in *APS MARCH MEETING 2011*, MAR11-2010-000974, session Y45, (Atom Interactions with Molecules, Surfaces, and X-Rays).

Hajihashemi, M. R. and **M. El-Shenawee**, "Inverse Scattering Level Set Algorithm for Retrieving the Shape and Location of Multiple Targets," *Proceedings of the EuCAP 2011*, Rome, Italy, April 11-15, pp. 3979-3983, 2011.

Hajihashemi, M. R. and **M. El-Shenawee**, "Inverse scattering of three-dimensional PEC objects using the level-set method," *Progress In Electromagnetics Research*, vol. 116, 23-47, 2011.

Han, D. Assalone, Z. Li, E. Ciocan, M. Lloyd, T. Moriarty, K. Emery, J. Wu, S. Lee, S. Mangham, R. Vanga, **M. O. Manasreh**, *37th IEEE Photovoltaic Specialist Conference*, June 19-24, 2011.

Hassan, A. M. and **M. El-Shenawee**, "Modeling the Electrophysiological Activities of Breast Tumors with Different Morphologies," *Proceedings of the IEEE International Symposium on Antennas and Propagation and USNC/URSI National Radio Science Meeting*, Spokane, WA, USA, pp. 726-729, July 3-8, 2011.

Hasan, J., **S. S. Ang**, "A high-efficiency Digitally Controlled RGB Driver for LED pixels," *IEEE Transactions on Industry Applications*, vol. 47, no. 6, November/December 2011, pp. 2422-2429.

Hassan, A. M. and **M. El-Shenawee**, "The Diffusion-Drift Algorithm for Modeling the Biopotential Signals of Breast Tumors," *NIH Cancer Detection and Diagnostics Technologies for Global Health*, NIH campus- Building 45, Bethesda, Maryland, USA, Aug. 22-23, 2011.

Hassan, A. M., M. R. Hajhashemi, and **M. El-Shenawee**, "Level Set Algorithm for the Shape Reconstruction in the Terahertz Band," *Proceedings of the IEEE International Symposium on Antennas and Propagation and USNC/URSI National Radio Science Meeting*, Spokane, WA, USA, July 3-8, 2011.

Hassan, A. M. and **M. El-Shenawee**, "Electromagnetic Techniques for Breast Cancer Detection," *IEEE Reviews in Biomedical Engineering*, vol. 4, pp. 103-118, 2011.

Hassan, A. M. and **M. El-Shenawee**, "Parallel Implementation of the Diffusion-Drift Algorithm for Modeling the Electrophysiological Activity of Breast Tumors," *Journal of Parallel and Distributed Computing*, vol. 71, no. 7, pp. 1011-1023, 2011.

Hild, K., I.P. Marko, **S.J. Sweeney**, S.R. Johnson, S.-Q. Yu and Y.-H. Zhang, "Influence of de-tuning and non-radiative recombination on the temperature dependence of 1.3 μ m GaAsSb/GaAs Vertical Cavity Surface Emitting Lasers," *Appl. Phys. Lett.* 99, 071110 (2011).

Holloosi, B., J. Di, S. C. Smith, and **H. A. Mantooh**, "Delay-Insensitive Asynchronous Circuits for Operating under Extreme Temperatures," *Government Microcircuit Applications & Critical Technology Conference*, March 2011, pp. 407-410.

Ji, L. and **V. V. Varadan**, "Competing Effects of Field Localization and Absorption Enhancement using Plasmonic Nanostructures in Thin Film a-Si Solar Cells," *37Th IEEE PhotoVoltaic Specialists Conference (PVSC)*, June 2011. Also selected for oral presentation, only 25% of papers accepted at the PVSC are selected for oral presentation.

Ji, L. and **V. V. Varadan**, "Short Wavelength Absorption Loss due to Plasmonic Nanoparticles Top-coated on Thin Film Solar Cells," *37Th IEEE PhotoVoltaic Specialists Conference (PVSC)*, June 2011. (Poster Presentation).

Ji, L. and **V.V. Varadan**, "Fishnet Metastructure for Efficiency Enhancement of a Thin Film Solar Cell," *Journal of Applied Physics*, Volume 11, 043114, 2011.

Khorrami, M., **S. El-Ghazaly**, S.-Q. Yu, H. Naseem, "Analytical modeling of THz wave propagation inside ungated two dimensional electron gas layers," *Microwave Symposium Digest (MTT)*, 2011 IEEE MTT-S International.

Khorrami, M., **S. El-Ghazaly**, S.-Q. Yu, Hameed Naseem, "Analytical modeling of THz wave propagation inside ungated two dimensional electron gas layers," *Microwave Symposium Digest (MTT)*, 2011 IEEE MTT-S International.

Killeen, P., J. Monkus, E. Klessig, D. Hearn, **J. Wu**, and S. C. Smith, "Developing a Smart Home System," *International Conference on Embedded Systems and Applications, July 2011*, pp. 148-152.

Kim, I. and **V. V. Varadan**, "Flexible Isotropic Antenna using a Split Ring Resonator on a Thin Film Substrate," *IEEE Antennas & Propagation Society International Conference, Spokane, WA, July, 2011*.

Kladko, V. P., A. V. Kuchuk, N. V. Safryuk, V. F. Machulin, P. M. Lytvyn, V. G. Raicheva, A. E. Belyaev, Yu. I. Mazur, E. A. DeCuir, Jr.; M. E. Ware, **M. O. Manasreh**, G. J. Salamo, "Influence of template type and buffer strain on structural properties of GaN multilayer quantum wells grown by PAMBE, an x-ray study," *Journal of Physics D* 44, 025403-8 (2011).

Kumar, P.S., S. Oh, P. Rai, H. Kwon, N. Banerjee and **V. K. Varadan**, "Design and implementation of a Bluetooth-based band-air pulse rate sensor," *Nanosensors, Biosensors and Info-Tech Sensors and Systems*, SPIE v.7980, 2011.

Kwon, H., S. Oh, P. Kumar and **V. K. Varadan**, "Design of electrocardiography measurement system with an algorithm to remove noise," *Nanosensors, Biosensors and Info-Tech Sensors and Systems*, SPIE v.7980, 2011.

Lee, J., **V. K. Varadan**, "Synthesis and characterization of thiol-functionalized polymer as binder in conductive ink," *Nanosensors, Biosensors and Info-Tech Sensors and Systems*, SPIE v.7980, 2011.

Lee, U., S. H. Choi, **V. K. Varadan**, K. D. Song, Y. Park, "Development of diagnosis and treatment technology for brain disease using quantum material and nano probe pin device," *Nanosensors, Biosensors and Info-Tech Sensors and Systems*, SPIE v.7980, 2011.

Li, C., Z. Q. Zeng, D. S. Fan, Y. Hirono, **J. Wu**, T. A. Morgan, S.-Q. Yu, Zh. M. Wang, G. J. Salamo, Bismuth Nano-droplets for Group-V Based Molecular-Beam Droplet Epitaxy, *Appl. Phys. Lett.*, 99, 243113 (2011).

Luo, L., Z. Xu, G. Niu, P.S. Chakraborty, T. D. Peng Cheng, K. Moen, J. D. Cressler, M. Mudholkar, **H. A. Mantooth**, "Wide temperature range compact modeling of SiGe HBTs for

space applications,” *IEEE 43rd Southeastern Symposium on System Theory (SSST)*, pp. 110-113, 2011.

Mackey, K., **R.A. McCann**, R. Winkelman, “A pilot study of battery storage for implementing remand response with renewable energy,” *National Rural Electric Cooperatives Annual Meeting – 2011 CRN Summit*, Cleveland (OH), July 19-20, 2011.

Mantooth, H. A., D. Sheridan, J. Casady, and E. Santi, “A Physics-Based Model for a SiC JFET Accounting for Electric-Field-Dependent Mobility,” *IEEE Trans. On Industry Applications*, vol. 47, no. 1, pp. 199-211, Jan.-Feb. 2011.

Mazur, Yu. I., V. G. Dorogan, M. Schmidbauer, G. G. Tarasov, S. R. Johnson, X. Lu, **S.-Q. Yu**, Zh. M. Wang, T. Tiedje, and G. J. Salamo, “Optical evidence of quantum well channel in low-temperature molecular beam epitaxy grown Ga(AsBi)/GaAs nanostructures,” *Nanotechnology* 22 (2011) 375703.

McCann, R.A., R. Winkelman, D. Moody, “A battery system for distributed demand response in rural environments,” *Biennial International Conference on Electrical Energy Storage and Technologies (EESAT 2011)*, San Diego (CA), October 16-19, 2011.

McCann, R.A., R. Winkelman, D. Moody, “Evaluation of battery-based distributed energy storage systems in rural applications,” *Proceedings of 44th Annual Frontiers of Power Conference*, Stillwater (OK), October 24-25, 2011.

McCann, R.A., K. Rahman, “Design research in cyber-physical systems through weak-bisimulation,” *Journal of Systemics, Cybernetics and Informatics*, vol. 9, no. 7, pp. 58-62, December, 2011.

Mietze, C., E.A. DeCuir, Jr., **M.O. Manasreh**, K. Lischka, and D.J. As, “Intrasubband transitions in cubic AlN/GaN superlattices for detectors from near to far infrared,” *Phys. Stat. Solid. (c)* 8, 1204–1207 (2011).

Mudholkar, M., M. Saadeh, **H. A. Mantooth**, “A datasheet driven power MOSFET model and parameter extraction procedure for 1200V, 20A SiC MOSFETs,” *European Conference on Power Electronics and Applications Conference*, 10 pages, Birmingham, England, UK, Aug. 29 – Sept. 1, 2011.

Nam, W. J., L. Ji, **V. V. Varadan** and S.J. Fonash, “Designing Optical Path Length, Photonic, and Plasmonic Effects into Nanostructured Solar Cells,” *Invited Paper, IEEE Nano 2011*; October, 2011.

Nam, W.J., L. Ji, N.D. Nguyen, **V. V. Varadan** and S.J. Fonash, “Light and Carrier Collection Management Cell Architectures: some Configuration Comparisons,” *37th IEEE PhotoVoltaic Specialists Conference (PVSC)*, June 2011. (Poster Presentation).

Nam, W. J., L. Ji, T.L. Benanti, **V.V. Varadan**, S. Wagner, W. Nemeth, Q. Wang, D. Neidich and S.J. Fonash, “Exploration of Light and Carrier Collection Management in Nanostructured a-Si:H Solar Cells,” *J. Appl. Phys. Letters*, Volume 99, 073113, 2011.

Oh, S., H. Kwon and **V. K. Varadan**, "Ubiquitous health monitoring system for diagnosis of sleep apnea with Zigbee network and wireless LAN," *Journal of Nanotechnology in Engineering and Medicine*, 1. pp. 021008-1, 021008-8, 2011.

Oh, S., H. Kwon and **V. K. Varadan**, "Wireless remote monitoring system for sleep apnea," *Nanosensors, Biosensors and Info-Tech Sensors and Systems*, SPIE v.7980, 2011.

Platania, E., Z. Chen, F. Chimento, A. Raciti, A. Grekov, R. Fu, L. Lu, A. Raciti, J. L. Hudgins, **H. A. Mantooth**, D. Sheridan, J. Casady, and E. Santi, "A Physics-Based Model for a SiC JFET Accounting for Electric-Field-Dependent Mobility," *IEEE Trans. On Industry Applications*, vol. 47, no. 1, pp. 199-211, Jan.-Feb. 2011.

Rai, P., P. S. Kumar, S. Oh, H. Kwon, G. N. Mathur and **V. K. Varadan**, "Printable low cost sensor systems for healthcare smart textiles," *Nanosensors, Biosensors and Info-Tech Sensors and Systems*, SPIE v.7980, 2011.

Ruffin, P., C. L. Brantley, E. Eugene, R. J. Keith, W. Chew, L. C. Warren, P. R. Ashley, H. O. Everitt, E. Webster, J. V. Foreman, M. Sanghadas, S. H. Crutcher, M. G. Temmen, **V. K. Varadan**, D. Hayduke, P. C. Wu, C. G. Khoury, Y. Yang, T-H. Kim, T- Vo-Dinh, A. S. Brown, J. Callahan, "Nanotechnology research and development for military and industrial applications," *Nanosensors, Biosensors and Info-Tech Sensors and Systems*, SPIE v.7980, 2011.

Sabbah, A., A. M. Hassan, and **M. El-Shenawee**, "Terahertz Waves for Imaging Explosive Materials using Tomography Methods," *Proceedings of the IEEE International Symposium on Antennas and Propagation and USNC/URSI National Radio Science Meeting*, Spokane, WA, USA, July 3-8, 2011.

Schirmer, C., B. Rowden, **S. S. Ang**, H. A. Mantooth and J. C. Balda, "Packaging and Modeling of SiC Power Modules," *The Electrochemical Society Meeting Extended Abstract*, Boston (MA), May 2011.

Schirmer, K., B. Rowden, **H. A. Mantooth**, S. S. Ang, and J. C. Balda, "Packaging and modeling of SiC power modules," *Proc. 220th Electrochemical Society Meeting – Symposium on GaN and SiC Power Technologies*, Boston, MA, Oct. 2011.

Shumate, S. D., M. K. Hafeezuddin, **H. A. Naseem**, D. A. Hutchings, "Microstructural Influence of Hydrogenated Amorphous Silicon on Polycrystalline Emitter Solar Cells Prepared by Top-down Aluminum Induced Crystallization," *Proc. of the 2011 IEEE PVSC*, Seattle, Washington, June 19-24, 2011.

Smith, C. S., C. M. Bowie, K. D. Song, H. Yoon, **V. K. Varadan** and W-K. Kim, "Electrochemical investigation of nano-electrodes for biomedical sensing applications in the brain," *Nanosensors, Biosensors and Info-Tech Sensors and Systems*, SPIE v.7980, 2011.

Smith, S. C., and J. Di, "Integrating Asynchronous Digital Design into the Undergraduate Computer Engineering Curriculum Throughout the Nation," *NSF CCLI/ TUES PI Conference*, January 2011.

Sun, N., **J. Wu**, "Optimum sampling in a spatial-temporally correlated wireless sensor network," in *Proc. IEEE Global Telecommun. Conf. Globecom'11*, Dec. 2011.

Tao, J., **J. Wu**, Y. Zheng, "Reliability-based turbo detection," *IEEE Trans. Wireless Commun.*, vol. 10, pp. 2352-2361, July 2011.

Tao, J., **J. Wu**, Y. Zheng, and C. Xiao, "Enhanced MIMO LMMSE turbo equalization: algorithm, simulations, and undersea experimental results," *IEEE Trans. Sig. Processing*, vol. 59, pp.3813-3823, Aug. 2011.

Valle-Mayorga, J., C. Gutshall, I. Escorcia, **H. A. Mantooth**, B. Reese, M. Schupbach, A. Lostetter, "High Temperature Silicon-on-Insulator Gate Driver for SiC-FET Power Modules," *International Conference and Exhibition on High Temperature Electronics Network (HiTEN)*, 7 pgs., Oxford, England, July 18-20, 2011.

Varadan, V. K., P. Kumar, S. Oh, G. N. Mathur, P. Rai and L. Kegley, "e-bra with nanosensors, smart electronics and smart phone communication network for heart rate monitoring," *Nanosensors, Biosensors and Info-Tech Sensors and Systems*, SPIE v.7980, 2011.

Varadan, V. V., H. Huang, I. Kim and S. Weiss, "SRR-Loaded Small Dipole Antenna with Electromagnetic Bandgap Ground Plane," *IEEE Antennas & Propagation Society International Conference*, Spokane, WA, July, 2011.

Varadan, V.K., "An EKG in your underwear," *Mechanical Engineering*, vol. 133, pp. 34-37, 2011.

Varadan, V. K., P. Kumar, S. Oh, H. Kwon, P. Rai, N. Banerjee and R. Harbaugh, "e-nanoflux sensor system: smart phone-based roaming health monitor," *Journal of Nanotechnology in Engineering and Medicine*, 1. pp. 011016-1, 011016-11, 2011.

Varadan, V. K., P. Kumar, S. Oh. L. Kegley and P. Rai, "e-bra with nanosensors for real time cardiac health monitoring and smart phone communication," *Journal of Nanotechnology in Engineering and Medicine*, 1. pp. 021011-1, 021011-7, 2011.

Walker M. L., J. Tao, **J. Wu**, and Y. R. Zheng, "Low complexity Turbo detection of coded under-determined MIMO systems," in *Proc. IEEE Intern. Conf. Commun ICC'11*, May 2011.

Wang, G., L. Chen, G. N. Mathur and **V. K. Varadan**, "Lithium vanadium oxides as cathode materials in lithium-ion batteries for soldier portable power systems", *Nanosensors, Biosensors and Info-Tech Sensors and Systems*, SPIE v.7980, 2011

Wang, H. and **V. V. Varadan**, "Low Profile Wideband Hybrid Dielectric Resonator and Split Ring Resonator Antenna", *IEEE Antennas & Propagation Society International Conference*, Spokane, WA, July, 2011.

Wu, J., S. Lee, V. R. Reddy, **M. O. Manasreh**, B. D. Weaver, M. K. Yakes, C. S. Furrow, Vas. P. Kunets, M. Benamara, and G. J. Salamo, "Photoluminescence plasmonic enhancement in InAs quantum dots coupled to gold nanoparticles," *Materials Letters* 65, 3605-3608 (2011).

Wu J., Y. Zheng, "Oversampled orthogonal frequency division multiplexing in doubly selective fading," *IEEE Trans. Commun.*, vol. 59, pp. 815-822, Mar. 2011.

Wu, S.-N., **S.-Q. Yu**, D. Ding, S. R. Johnson, and Y.-H. Zhang, "Ultra High Luminescence Extraction via the Monolithic Integration of a Light Emitting Active Region with a Semiconductor Hemisphere," *J. Vac. Sci. Technol. B* 29, 031213, 2011.

Wu J., G. Y. Li, "Cross-layer design of random on-off accumulative transmission with iterative detections," in *Proc. IEEE Global Telecommun. Conf. Globecom'11*, Dec. 2011.

Wu J., G. Zhou, "A new ultra-low power wireless sensor network with integrated energy harvesting, data sensing, and wireless communication," in *Proc. IEEE Intern. Conf. Commun ICC'11*, May 2011.

Xie, J., L. Chen and **V. K. Varadan**, "3D helical nanomaterials: synthesis, characterization and applications," *Nanoscience and Nanotechnology*, vol. 11, pp. 1-58, 2011.

Xie, J., L. Chen, **V. K. Varadan**, S. Chetan and M. Srivastan, "Magnetic nanotube influence the response of dorsal root ganglion neurons to alternating magnetic fields," *Journal of Nanotechnology in Engineering and Medicine*, 1. pp. 031009-1, 031009-9, 2011.

Xu, Z., G. Niu, L. Luo, J. D. Cressler, M. L. Alles, R. Reed, **H. A. Mantooth**, J. Holmes, P. W. Marshall, "Charge Collection and SEU in SiGe HBT Current Mode Logic Operating at Cryogenic Temperatures," *IEEE Trans. Nuclear Science*, vol. 57, issue 6, part 1, pp. 3206-3211, 2010. (not counted in 2010 faculty review due to late publication).

Zeng, Z., D. Fan, C. Li, Y. Hirono, T. A. Morgan, Z. M. Wang, **S.-Q. Yu**, A. Guo, G. J. Salamo, "Epitaxial Growth of High-quality Bi₂Te₃ and Sb₂Te₃ Thin Films on GaAs (111)," *MRS fall meeting 2011*, Boston.

Zhou G., **J. Wu**, and K. Sohraby, "Cooperative spectrum sensing with a progressive MAP detection algorithm," in *Proc. IEEE Global Telecommun. Conf. Globecom'11*, Dec. 2011.

Zhou, L., and **S. C. Smith**, "Standby Power Reduction Techniques for Asynchronous Circuits with Indeterminate Standby States," *International Conference on Computer Design*, July 2011, pp. 10-16.

Zhou, L., M. Huang, and **S. C. Smith**, "High-Performance and Area-Efficient Hardware Design for Radix-2k Montgomery Multipliers," *International Conference on Computer Design*, July 2011, pp. 65-71.

Zhou, L. and **S. C. Smith**, “New Implementations of Quasi-Delay- Insensitive Asynchronous Pipelines,” Elsevier’s Integration, the VLSI Journal.

Zhou, L., R. Parameswaran, R. Thian, **S. C. Smith**, and J. Di, “MTNCL: An Ultra-Low Power Asynchronous Circuit Design Methodology,” *Elsevier’s Integration, the VLSI Journal*.

Zui, R., G. L. Huang, H. Yoon, C. S. Smith and **V. K. Varadan**, “Biomedical strain analysis at the interface of brain and nanowire electrodes on a neural probe,” *Journal of Nanotechnology in Engineering and Medicine*, 1. pp. 031001-1, 031001-6, 2011.

IV. Unrefereed Publications and Proceedings

El-Shenawee, M. and A. M. Hassan, “Terahertz Imaging and Sensing Technology Annual Report”, *Annual Report to the Army Research Laboratory*, accomplished under Cooperative Agreement Number W911NF-10-2-0093.

Huang, L., E. Decrossas, B. Newton, L. Ji, **H. Naseem**, V.V. Varadan, S.-Q. Yu, “Nanofabrication of integrated metamaterials and semiconductors for optoelectronic devices,” *Arkansas ASSET II NSF EPSCoR project annual meeting* (2011, Heber Springs).

Ji, L., L. Huang, **H. Naseem**, S.-Q. Yu, V.V. Varadan, “Ellipsometric characterization of metamaterial nanostructures on semiconductor substrates for solar cell applications,” *Arkansas ASSET II NSF EPSCoR project annual meeting* (2011, Heber Springs).

McCann, R.A., R. Winkelman, D. Moody, “Advanced lead-acid battery-based distributed energy storage system,” *Infocast Advanced Battery R&D Symposium, Santa Clara (CA)*, January 10-12, 2011 (invited paper).

Naseem, H. A., A. Bhattacharya, V. Varadan, Industrial Outreach, *Arkansas ASSET II EPSCoR project annual meeting NSF* (2011, Heber Springs).

Naseem, H. A., “Nanoplasmonic Enhancement of Efficiency in Thin Silicon Based Solar Cells,” *Arkansas ASSET II NSF EPSCoR project annual meeting* (2011, Heber Springs).

Shumate, S., M. K. Hafeezuddin, **S.-Q. Yu**, H. A. Naseem, “Microstructural Influence of Hydrogenated Amorphous Silicon on Polycrystalline Emitter Solar Cells Prepared by Top-Down Aluminum Induced Crystallization,” In *Arkansas ASSET II NSF EPSCoR project annual meeting* (2010, Heber Springs).

Shumate, S., M. K. Hafeezuddin, **S.-Q. Yu**, H. Naseem, “Microstructural Influence of Hydrogenated Amorphous Silicon on Polycrystalline Emitter Solar Cells Prepared by Top-Down Aluminum Induced Crystallization,” *Arkansas ASSET II NSF EPSCoR project annual meeting* (2011, Heber Springs).

Young, M., B. Newton, H. Abu-Safe, **H. Naseem**, S.-Q. Yu, "3D Nanostructured Crystalline Silicon/Amorphous Silicon Heterojunction Solar Cells," *Arkansas ASSET II NSF EPSCoR project annual meeting* (2011, Heber Springs).

Yu, S.-Q., "Fabricate and characterize photovoltaic devices with integrated optical metamaterials for enhanced performance," In *Arkansas ASSET II NSF EPSCoR project annual meeting* (2010, Heber Springs).

V. Invited Lectures

Ang, S. S., "Teaching Power Management Circuits and Design," Texas Instruments' Analog Design Contest Symposium, July 10-12, 2011, Dallas, Texas

Balda, J. C., and S. S. Ang, "Electrical Engineering R/D at the University of Arkansas," Northrop Grumman Inc., April 6, 2011, Baltimore, MD.

Balda, J. C., and S. S. Ang, "Power Electronics Packaging at the University of Arkansas," Industrial Technology Research Institute (ITRI), October 2011, Hsingchu, Taiwan, ROC.

Balda, J. C., and S. S. Ang, "Power Electronics Research at the University of Arkansas," Zhejiang University, June 2011, Hangzhou, China.

El-Shenawee, M. "Electromagnetic Imaging for Breast Cancer Research," Proc. IEEE Radio and Wireless Symposium: BioWireleSS, Phoenix, Arizona, USA, January 16-19, pp. 55-58, 2011. (invited talk for 40 minutes, opening the session).

El-Shenawee, M. "Inverse scattering level set algorithm for retrieving the shape and location of multiple targets", February 21, 2011 at LEAT Lab., Nice, France.

El-Shenawee M. "Review of electromagnetic imaging techniques for breast cancer research," March 23, 2011 at LEAT Lab, Nice, France.

El-Shenawee, M. "Level Set and Nano-antennas", April 18, 2011 at Orange Telecom France Labs, La Turbie, France.

El-Shenawee, M. "Biopotential for breast cancer detection", April 23, 2011 at LEAT Lab., Nice, France.

Mantooth, H. A. "Prospects of Future Smart Grid Technology and High-Power SiC Modules," Keynote Address at International Symposium on SiC Power Electronics 2011, Nagoya, Japan, 65 slides, Dec. 7, 2011.

Mantooth, H. A., S. S. Ang, "Advances in SiC Power Modules," Wide Bandgap Workshop, Hsinchu, Taiwan, 36 slides, April 29, 2011.

Mantooth, H. A. "Advances in SiC Power Modules," ARPAe & EERE Joint Workshop on Power Electronics in Photovoltaic Systems, Washington, D.C., 19 slides, Feb. 8, 2011.

Mantooth, H. A., “Evolution to Revolution: The Emerging Smart Grid in America,” 22nd National NSF EPSCoR Conference, Coeur d’Alene, Idaho, 45 slides, Oct. 27, 2011.

Smith, S. C. and J. Di, “Ultra-Low Power Asynchronous Digital Circuits,” seminar at Texas A&M University, October 2011.

Smith, S. C., “Ultra-Low Power Asynchronous Digital Circuits,” tutorial at Hawaii University International Conferences on Mathematics and Engineering, June 2011.

Smith, S. C. and R. Guha, “Developing Modular Curricula,” workshop at NSF CCLI/TUES PI Conference, January 2011.

Varadan, V. K., International Conference on Sensors, Tampere, Finland, June 4-7, 2011, “Nanotechnology based point-of-care diagnostics and therapeutics for neurological and cardiovascular disorders” (keynote talk).

Varadan, V. K., “Nanotechnology based point-of-care diagnostics and therapeutics for neurological disorders”, Proceedings of the ASME First Global Congress on Nanoengineering for Medicine and Biology (key note talk), pp. 1-2, 2010.

Varadan, V. K., International Conference on Emerging Innovations in Drug Delivery Technology, Coimbatore, India, February 11, 2011, “Nanomedicine” (plenary talk).

Varadan, V. K., “Nanotechnology and Smart Devices in Engineering, Life Sciences and Medicine” DRDO Conference on Nanotechnology, Delhi, India (Plenary talk), December 13-15, 2011.

Varadan, V. K., “Wearable garments and electronics with nanosensors for monitoring and control of cardiovascular diseases and neurological disorders”, International Conference on Medical Sciences, Gachoen Medical University, Korea, May 10-12, 2011 (plenary talk).

Varadan, V. K., “Instrumentation and control for brain machine interface smart systems with wireless nanosensors, MEMS and NEMS”, First International Conference on Modern Trends in Instrumentation and Control, Coimbatore, September 2, 2011.

Yu, S.-Q., “Novel GaInAsSbBi Materials for Mid-Infrared Type-I Quantum Well Lasers,” in International workshop on 6.1 Å II-VI and III-V materials and their integration, Phoenix, 2011.

VI. Other Lectures, Papers, and Oral Presentations

Naseem, H. was invited by the District Chapter of the Ahmadiyya Youth Association to give a talk on Islam and Science at the Ahmadiyya Center, Kannoor, Kerala, June 6, 2011.

VII. Other Creative Endeavors

El-Shenawee, Magda: An invention disclosure on “Using Terahertz waves for the detection of bio-threat bacteria such as anthrax” was filed with the Technology Licensing Office (TLO) at the University of Arkansas. The university patent committee approved that the University takes assignment of the invention.

Di, Jai and Smith, S. C., *Ultra-Low Power Multi-Threshold Asynchronous Circuit Design*, U.S. Patent: 7,977,972 B2, July 12, 2011.

Varadan, V. K. organized an International Conference and served as the Executive Chairman, Nano-, Bio-, and Info-Tech Sensors and Systems, San Diego, March 7-11, 2011.

Varadan, V. K. Organized an International Conference and served as the Track Chairman on Neurological and Cardiovascular Disorder, Global Congress on Nanoengineering for Medicine and Biology, Incheon, Korea, March, 2011.

“Beyond earth friendly: How renewables will impact the grid,” *Electric Energy T&D magazine*, March 2011.

“Silicon Carbide: Promising Technology on the Precipice,” *Entrepreneurial Energy*, Erik Limpaecher, June 2011. <http://entrepreneurialenergy.wordpress.com/2011/06/13/silicon-carbide-on-the-precipice/>

EEWeb Spotlight Featured Engineer – **A. Mantooth**, Nov. 2011.
<http://www.eeweb.com/spotlight/interview-with-alan-mantooth>