

JOHN C. ALDRIN

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Education

Northwestern University, Evanston, IL 60208

Theoretical and Applied Mechanics, Doctor of Philosophy, June 2001

Dissertation: Models and Classification Procedures for Ultrasonic Inspection of Holes for Fatigue Cracks (Prof. J. D. Achenbach - Major Professor)

Purdue University, West Lafayette, IN 47907

Mechanical Engineering, Master of Science, May 1996

Thesis: Investigation of Vibration Control Systems Applied to an Automatic Washer Suspension Design (Prof. W. Soedel - Major Professor)

Purdue University, West Lafayette, IN 47907

Mechanical Engineering, Bachelor of Science, May 1994, with Distinction

Undergraduate Research Project: Dynamic Analysis of an Historical Ballistic Mechanism

Graduate Level Coursework - *Mechanics:*

Mechanical Vibration, Advanced Dynamics, Fundamentals of Fluid Dynamics, Engineering Acoustics, Advanced Engineering Acoustics, Theory of Elasticity II (Contact Mechanics), Vibration of Continuous Systems, Wave Propagation in Elastic Solids.

Graduate Level Coursework - *Mathematical Modeling, Computational Methods and Optimization:*

Complex Analysis, Differential Equations in Mathematical Physics (2,3), Nonlinear Engineering, Asymptotic and Perturbation Methods (1,2), Numerical Methods in Mechanical Engineering, Finite and Boundary Element Methods, Optimal Design.

Graduate Level Coursework - *Nondestructive Testing, Data Analysis and Control:*

Nondestructive Testing, Theory and Design of Control Systems, Microprocessors in Electromechanical Systems, Statistics, Advanced Digital Signal Processing.

Work Experience

Computational Tools, Gurnee, IL 60031

Engineering Consultant, February 2001 to present

- Specialize in research and applications development services on nondestructive evaluation (NDE) modeling and simulation, data analysis, inverse methods and reliability assessment.
- As Visiting Scientist with AFRL/RXCA, developed strategy and conducted research on computational methods in NDE of aircraft structures and propulsion components.
- Performed research and development of models in ultrasonic and eddy current NDE.
- Developed algorithms with SAIC Ultra Image Int. for automated ultrasonic inspections for C-130 beam cap holes and C-130 hat section / rainbow fitting holes.
- Developed methods and performed demonstrations for model-assisted probability of detection (MAPOD) evaluation for NDE and structural health monitoring applications.
- Provided services to: USAF/AFRL, NASA, SAIC, iTi/Mistras, TRI/Austin, Victor Technologies, BP, Southern Research, Radiance Technologies, Intelligent Automation Inc., Vibrant Corp.
- Participate as member of NASA NESC TDT on Nondestructive Evaluation.

Northwestern University, Center for Quality Engineering, Evanston, IL 60208

Graduate Research Assistant, January 1998 – February 2001

- Developed a simulation of the scattering of an ultrasonic transducer signal by a C-141 weep hole (cylindrical cavity) with a surface breaking crack using the boundary element method.
- Developed algorithm using neural networks to detect bottom and top cracks in weep holes.
- Developed models and ultrasonic inspection procedures for special holes cases: fluid filled cavity, cavity with elastic insert and stiffness interface, cavity with elastic coating.

**Work
Experience
(cont.)**

Whirlpool Corporation, Benton Harbor, MI 49022

Project Engineer, May 1996 - December 1997

St. Joseph Technical Center - Advanced Laundry Development, May 1997 - December 1997

- Successfully led Catalyst wash system sub-team through Concept Selection Milestone.
- Corporate Technology Development - Fabric Care Advanced Development, May 1996-April 1997
- Developed and implemented novel automatic washer spin dynamics test platform.
- Performed fundamental experimental studies on automatic washer suspension performance.
- Developed strategy and performed investigations for the application of sensors to washers.

Purdue University, Herrick Laboratories, West Lafayette, IN 47907

Graduate Research Assistant, January 1995 - May 1996

- Performed review of the state-of-the-art in vibration control systems.
- Developed analysis methodology and performed assessment of the most promising vibration control systems for application to automatic washer suspension design.
- Performed analytical investigations of adaptive passive automatic washer suspension concepts.

Whirlpool Corporation, Benton Harbor, MI 49022

Engineer, May 1994 - December 1994

Corporate Technology Development - Fabric Care Advanced Development

- Assessed performance of washer suspension using dynamic models developed with ADAMS.
- Performed designed experiments on prototype automatic washer suspension.
- Performed modal analysis for prototype automatic washer tub structure.

Whirlpool Corporation, Benton Harbor, MI 49022

Engineering Co-op Intern, May 1990 - April 1993

- Experimentally analyzed dynamic forces of an automatic washer suspension structure.
- Performed extensive work in modal analysis and operational deflection shapes of structures.
- Conducted sound quality survey of automatic washers.
- Evaluated CFC recovery processes for refrigerator systems.
- Performed experimental investigations of energy use, air flow and temperature in dryers.
- Designed software program which processed spectrophotometer data.

**Training
and Skills**

- *Teaching experience:* Substitute lecturer for course on nondestructive evaluation (2000), Mentor for undergraduate research project summer intern (1998).
- *Software experience:* COMSOL, FEAP, ABAQUS, ADAMS, OPERA-3D, VIC-3D, ECSIM, Imagine3D, CIVA (UT), Matlab, Maple, Minitab, R, LabVIEW, Origin, MS Office, MS Access, MS Project.
- *Program languages:* Python, C++, C#, Visual Basic, Fortran, Java and Assembly
- *Laboratory skills:* Buildup of mechanical and electrical aspects of prototypes, Setup of data acquisition and control systems (National Instruments).
- *Technical seminars:* NDT of Composites, Active Vibration Control, Sensors, Introduction into Taguchi Techniques, Design of Experiments for Discovery, Improvement and Robustness, Elementary ADAMS.
- *Management seminars:* Precision Management, Working in Teams.
- *Foreign languages:* Introductory language training in Italian, French and German.

Publications

1. Lindgren, E., Aldrin, J. C., Forsyth, D. S., "Intelligence Augmentation for Aviation-based NDE Data," *30th ASNT Research Symposium*, (2022), DOI: 10.32548/RS.2022.005.
2. Wertz, J., Homa, L., Lesthaeghe, T., Aldrin, J., "Classification of Composite Delaminations via Pitch-Catch Phased Array Ultrasound," *Journal of Nondestructive Evaluation*, 41 (1), (2022) p 1-2.
3. Aldrin, J. C., "The Human-Machine Interface (HMI) with NDE 4.0 Systems," *Handbook on Nondestructive Evaluation 4.0*, Meyendorf, N., Ida, N., Singh, R., Vrana, J. (Eds.), (2021) ISBN 978-3-030-73207-3.
4. Aldrin, J. C., Wertz, J. N., Welter, J. T., Lindgren, E., Schehl, N., Kramb, V., Zainey, D., "Algorithms for Phased Array Ultrasonic Characterization of the Hidden Region of Impact Damage in Composites," *Research in Nondestructive Evaluation*, 31(5-6), (2020), pp. 275-289, DOI: 10.1080/09349847.2020.1847374.
5. Aldrin, J. C., "Intelligence Augmentation and Human Machine Interface Best Practices for NDT 4.0 Reliability," *Materials Evaluation*, 78 (7), (2020) pp. 869-879. DOI: 10.32548/2020.me-04133.
6. Welter, J. T., Sparkman, D. M., Uchic, M. D., Aldrin, J. C., Zainey, D., Lesthaeghe, T., Kramb, V., "Azimuthally-scanned Angled-beam Pulse-Echo Ultrasound for Characterization of Impact Damage in Composites," *ASME Journal of Nondestructive Evaluation*, 3(3) (2020), p. 031109, DOI: 10.1115/1.4046726.
7. Welter, J. T., Aldrin, J. C., Wertz, J. N., Kramb, V., Zainey, D., "Model Benchmarking Studies of Angle Beam Pulse-Echo Ultrasonic Inspection of Composites," *Materials Evaluation*, Vol. 78, n 1, pp 82-93, (2020).
8. Aldrin, J. C., Keiser, M., Motes, D., Flores-Lamb, J., Forsyth, D. S., Sabbagh, H. A., Sabbagh, E., Murphy, R. K., Mooers, R., Henry, C., Lindgren, E. A., "Progress and Challenges of Inverse Methods for Sizing Cracks in Multilayer Bolt-holt Eddy Current Inspections," *Electromagnetic Non-Destructive Evaluation (XXII)*, IOS Press, Ed. Tamburrino, A., Deng, Y., Chakrapani, S., (2020), pp 92-97.
9. Aldrin, J. C., Oneida, E. K., Shell, E. B., Sinha, V., Keller, K., Na, J. A., Hutson, A., Sabbagh, H. A., Sabbagh, E., Murphy, R. K., Mazdiyasn, S., Cherry, M. R., Sparkman, D., "Model-Based Inversion of Eddy Current Data for Classification and Sizing of Planar and Volumetric Discontinuities," *Electromagnetic Non-Destructive Evaluation (XXII)*, IOS Press, Ed. Tamburrino, A., Deng, Y., Chakrapani, S., (2020), pp 80-85.
10. Homa, L., Aldrin, J. C., and Cherry, M., "Bayesian Methods for Detection of Cracks in Titanium from Eddy Current Data," *Electromagnetic Non-Destructive Evaluation (XXII)*, IOS Press, Ed. Tamburrino, A., Deng, Y., Chakrapani, S., (2020), pp 86-91.
11. Aldrin, J. C., and Forsyth, D. S., "Demonstration of Using Signal Feature Extraction and Deep Learning Neural Networks with Ultrasonic Data for Detecting Challenging Discontinuities in Composite Panels," *45th Annual Review of Progress in QNDE*, AIP, 2102, p. 020012, (2019).
12. Aldrin, J. C., Lindgren, E. A., and Forsyth, D. S., "Intelligence Augmentation in Nondestructive Evaluation," *45th Annual Review of Progress in QNDE*, AIP, 2102, p. 020028, (2019).
13. Aldrin, J.C., Schehl, N. D., Kramb, V. A., Zainey, D., Welter, J.T., Wertz, J.N., Wallentine, S., Lindgren, E.A., Uchic, M. D., "Investigations of Pitch-Catch Angled-beam Ultrasonic NDE for Characterization of Hidden Regions of Impact Damage in Composites," *45th Annual Review of Progress in QNDE*, AIP, 2102, p. 040012, (2019).
14. Aldrin, J. C., Oneida, E. K., Shell, E. B., Sabbagh, H. A., Sabbagh, E., Murphy, R. K., Hutson, A. L., Mazdiyasn, S., Cherry, M. R., "Distinguishing Cracks and Non-metallic Inclusions Using Eddy Current Nondestructive Evaluation and Model-Based Inversion," *45th Annual Review of Progress in QNDE*, AIP, 2102, p. 080007, (2019).
15. Welter, J. T., Aldrin, J. C., Wertz, J. N., Kramb, V., Zainey, D., Schehl, N., Uchic, M. D. and Wallentine, S. M., "Oblique angle pulse echo ultrasound for delamination characterization," *45th Annual Review of Progress in QNDE*, AIP, 2102, p. 100001, (2019).
16. Wertz, J., Dierken, J., Zainey, D., Schehl, N. and Aldrin, J.C., "Ultrasound forward model validation of normal incidence longitudinal wave and angle beam shear wave inspection of a quasi-isotropic composite layup with embedded damage," *45th Annual Review of Progress in QNDE*, AIP, 2102, p. 020010, (2019).

17. Homa, L., Aldrin, J. C., and Cherry, M., "Statistical inversion of eddy current measurements of flaws in titanium," *45th Annual Review of Progress in QNDE*, AIP, 2102, p. 070006, (2019).
18. Sparkman, D., Wallentine, S., Flores, M., Wertz, J., Welter, J., Schehl, N., Dierken, J., Zainey, D., Aldrin, J. and Uchic, M., "A supervised learning approach for prediction of x-ray computed tomography data from ultrasonic testing data," *45th Annual Review of Progress in QNDE*, AIP, 2102, p. 030002, (2019).
19. Mayes, A., Heffernan, J., Jauriqui, L., Livings, R., Biedermann, E., Aldrin, J.C., Goodlet, B.R. and Mazdiyasni, S., "Process compensated resonance testing (PCRT) inversion for material characterization and digital twin calibration," *45th Annual Review of Progress in QNDE*, AIP, 2102, p. 020019, (2019).
20. Lindgren, E., Forsyth, D., Aldrin, J., Spencer, F., "Probability of Detection," *Nondestructive Evaluation of Materials*, Volume 17, ASM Handbook, Aquil Ahmad and Leonard J. Bond, ed., pp. 8-22, (2018).
21. Wertz, J., Homa, L., Welter, J., Sparkman, D., and Aldrin, J. C., "Case Study of Model-Based Inversion of the Angle Beam Ultrasonic Response From Composite Impact Damage," *ASME Journal of Nondestructive Evaluation*, 1 (4), p. 041001 (2018).
22. Aldrin, J. C., and Lindgren, E. A., "The Need and Approach for Characterization – US Air Force Perspectives on Materials State Awareness," *44th Annual Review of Progress in QNDE*, AIP, 1949, p. 020004 (2018).
23. Aldrin, J.C., Mayes, A., Jauriqui, L., Biedermann, E., Heffernan, J., Livings, R., Goodlet, B. and Mazdiyasni, S., "Uncertainty Quantification of Resonant Ultrasound Spectroscopy for Material Property and Single Crystal Orientation Estimation on a Complex Part," *44th Annual Review of Progress in QNDE*, AIP, 1949, p. 140010 (2018).
24. Aldrin, J.C., Wertz, J.N., Welter, J.T., Wallentine, S., Lindgren, E.A., Kramb, V. and Zainey, D., "Fundamentals of Angled-beam Ultrasonic NDE for Potential Characterization of Hidden Regions of Impact Damage in Composites," *44th Annual Review of Progress in QNDE*, AIP, 1949, p. 120005 (2018).
25. Hopkins, D., Datuin, M., Aldrin, J., Warchol, M., Warchol, L. and Forsyth, D., "B-scan technique for localization and characterization of fatigue cracks around fastener holes in multi-layered structures," *44th Annual Review of Progress in QNDE*, AIP, 1949, p. 140003 (2018).
26. Cherry, M.R., Hutson, A., Aldrin, J.C. and Shank, J., "Eddy current analysis of cracks grown from surface defects and non-metallic particles," *44th Annual Review of Progress in QNDE*, AIP, 1949, p. 140007 (2018).
27. Wertz, J., Homa, L., Welter, J., Sparkman, D. and Aldrin, J. C., "Gaussian process regression of chirplet decomposed ultrasonic B-scans of a simulated design case," *44th Annual Review of Progress in QNDE*, AIP, 1949, p. 130007 (2018).
28. Homa, L., Sparkman, D., Wertz, J., Welter, J., and Aldrin, J. C., "Signal Decomposition for Surrogate Modeling of a Constrained Ultrasonic Design Space," *44th Annual Review of Progress in QNDE*, AIP, 1949, p. 130006 (2018).
29. Welter, J.T., Wertz, J.N., Aldrin, J.C., Kramb, V. and Zainey, D., "Model-driven optimization of oblique angle ultrasonic inspection parameters for delamination characterization," *44th Annual Review of Progress in QNDE*, AIP, 1949, p. 130005 (2018).
30. Henry, C., Kramb, V., Welter, J.T., Wertz, J.N., Lindgren, E.A., Aldrin, J.C. and Zainey, D., "Optimization of an angle-beam ultrasonic approach for characterization of impact damage in composites," *44th Annual Review of Progress in QNDE*, AIP, 1949, p. 120001 (2018).
31. Mayes, A., Jauriqui, L., Biedermann, E., Heffernan, J., Livings, R., Aldrin, J.C., Goodlet, B. and Mazdiyasni, S., "Part-to-itself model inversion in process compensated resonance testing," *44th Annual Review of Progress in QNDE*, AIP, 1949, p. 140002 (2018).
32. Heffernan, J., Biedermann, E., Mayes, A., Livings, R., Jauriqui, L., Goodlet, B., Aldrin, J.C. and Mazdiyasni, S., "Detection and quantification of creep strain using process compensated resonance testing (PCRT) sorting modules trained with modeled resonance spectra," *44th Annual Review of Progress in QNDE*, AIP, 1949, p. 140006 (2018).
33. Schehl, N., Kramb, V., Dierken, J., Aldrin, J., Schwalbach, E. and John, R., "Ultrasonic assessment of additive manufactured Ti-6Al-4V," *44th Annual Review of Progress in QNDE*, AIP, 1949, p. 020008 (2018).

34. Aldrin, J. C., and Forsyth, D. S., "NDE Characterization Capability Evaluation", *Materials Evaluation*, Vol. 75, n 7, pp 870-879, (2017).
35. Oneida, E. K., Shell, E. B., Aldrin, J. C., Sabbagh, H. A., Sabbagh, E., Murphy, R. K., "Characterizing Surface-Breaking Cracks through Eddy Current NDE and Model-Based Inversion", *Materials Evaluation*, Vol. 75, n 7, pp 915-929, (2017).
36. Aldrin, J. C., Shell, E. B., Oneida, E. K., Sabbagh, H. A., Sabbagh, E., Murphy, R. K., Mazdiyasni, S., Lindgren, E. A., Mooers, R. D., "Model-based Probe State Estimation and Crack Inverse Methods Addressing Eddy Current Probe Variability," *43rd Annual Review of Progress in QNDE*, AIP, 1806, p. 110013 (2017).
37. Aldrin, J. C., Hopkins, D., Datuin, M., Warchol, M., Warchol, L., Forsyth, D., Buynak, C., Lindgren, E. A., "Model Benchmarking and Reference Signals for Angled-beam Shear Wave Ultrasonic NDE Inspections," *43rd Annual Review of Progress in QNDE*, AIP, 1806, p. 150001 (2017).
38. Hopkins, D., Datuin, M., Aldrin, J., Warchol, M., Warchol, L., Forsyth, D., "Localization and characterization of fatigue cracks around fastener holes using spherically focused ultrasonic probes," *43rd Annual Review of Progress in QNDE*, AIP, 1806, p. 090007 (2017).
39. Mooers, R. D., and Aldrin, J. C., "Continued developments in the modeling of complex dimensions and orientation variation in split D differential eddy current probes," *43rd Annual Review of Progress in QNDE*, AIP, 1806, p. 110012 (2017).
40. Wertz, J., Wallentine, S., Welter, J., Dierken, J. and Aldrin, J., "Volumetric characterization of delamination fields via angle longitudinal wave ultrasound," *43rd Annual Review of Progress in QNDE*, AIP, 1806, p. 090006 (2017).
41. McMahan Jr, J.A., Aldrin, J.C., Shell, E. and Oneida, E., "Bayesian flaw characterization from eddy current measurements with grain noise," *43rd Annual Review of Progress in QNDE*, AIP, 1806, p. 110014 (2017).
42. Biedermann, E., Heffernan, J., Mayes, A., Gatewood, G., Jauriqui, L., Goodlet, B., Pollock, T., Torbet, C., Aldrin, J.C. and Mazdiyasni, S., "Process compensated resonance testing modeling for damage evolution and uncertainty quantification," *43rd Annual Review of Progress in QNDE*, AIP, 1806, p. 090005 (2017).
43. Aldrin, J. C., Sabbagh, H. A., Zhao, L., Sabbagh, E., Murphy, R. K., Keiser, M., Flores-Lamb, J., Forsyth, D. S., Motes, D., Lindgren, E. A., Mooers, R., "Model-based Inverse Methods for Sizing Cracks of Varying Shape and Location in Bolt-hole Eddy Current (BHEC) Inspections," *42nd Annual Review of Progress in QNDE, Incorporating the 6th European-American Workshop on Reliability of NDE*, Vol. 1706, p. 090020, AIP Publishing, (2016).
44. Aldrin, J. C., Forsyth, D. S., and Welter, J. T., "Design and Demonstration of Automated Data Analysis Algorithms for Ultrasonic Inspection of Complex Composite Panels with Bonds," *42nd Annual Review of Progress in QNDE, Incorporating the 6th European-American Workshop on Reliability of NDE*, Vol. 1706, p. 120006, AIP Publishing, (2016).
45. Aldrin, J. C., Shell, E. B., Oneida, E. K., Sabbagh, H. A., Sabbagh, E., Murphy, R. K., Mazdiyasni, S., and Lindgren, E. A., "Model-based Inverse Methods for Sizing Surface-breaking Discontinuities with Eddy Current Probe Variability," *42nd Annual Review of Progress in QNDE, Incorporating the 6th European-American Workshop on Reliability of NDE*, Vol. 1706, p. 090002, AIP Publishing, (2016).
46. Aldrin, J. C., Annis, C., Sabbagh, H. A., and Lindgren, E. A., "Best Practices for Evaluating the Capability of Nondestructive Evaluation (NDE) and Structural Health Monitoring (SHM) Techniques for Damage Characterization," *42nd Annual Review of Progress in QNDE, Incorporating the 6th European-American Workshop on Reliability of NDE*, Vol. 1706, p. 200002, AIP Publishing, (2016).
47. Oneida, E. K., Shell, E. B., Aldrin, J. C., Sabbagh, H. A., Sabbagh, E. H., Murphy, R. K., Mazdiyasni, S., and Lindgren, E. A., "Flaw Characterization using Inversion of Eddy Current Response and the Effect of Filters and Scan Resolution," *42nd Annual Review of Progress in QNDE, Incorporating the 6th European-American Workshop on Reliability of NDE*, Vol. 1706, p. 090021, AIP Publishing, (2016).
48. Murphy, R. K., Sabbagh, H. A., Sabbagh, E. H., Zhou, L., Bernacchi, W., Aldrin, J. C., Forsyth, D. S., and Lindgren, E. A., "Nondestructive damage characterization of complex aircraft structures by inverse methods: advances in multiscale models," *42nd Annual Review of Progress in QNDE*,

- Incorporating the 6th European-American Workshop on Reliability of NDE*, Vol. 1706, p. 090007, AIP Publishing, (2016).
49. Mooers, R. D., and Aldrin, J. C., "Effects of Angular Variation on Split D Differential Eddy Current Probe Response," *42nd Annual Review of Progress in QNDE, Incorporating the 6th European-American Workshop on Reliability of NDE*, Vol. 1706, p. 090022, AIP Publishing, (2016).
 50. Biedermann, E., Jauriqui, L., Aldrin, J. C., Mayes, A., Williams, T., Mazdiyasni, S., "Uncertainty Quantification in Modeling and Measuring Components with Resonant Ultrasound Spectroscopy," *42nd Annual Review of Progress in QNDE, Incorporating the 6th European-American Workshop on Reliability of NDE*, Vol. 1706, p. 070008, AIP Publishing, (2016).
 51. Annis, C., Aldrin, J. C., and Sabbagh, H. A., "What's Missing in Nondestructive Testing Capability Evaluation?," *Materials Evaluation*, Vol. 73, n 1, pp. 44-54, (2015).
 52. Annis, C., Aldrin, J. C., and Sabbagh, H. A., "Profile Likelihood: What to Do When Maximum POD Never Gets to One," *Materials Evaluation*, Vol. 73, n 1, pp. 96-99, (2015).
 53. Aldrin, J. C., Forsyth, D. S., and Welter, J. T., "Progress on Automated Data Analysis Algorithms for Ultrasonic Inspection of Composites," *Review of Progress in QNDE*, Vol. 34, AIP, vol. 1650, pp. 1091-1101, (2015).
 54. Aldrin, J. C., Sabbagh, H. A., Annis, C., Shell, E. B., Knopp, J., and Lindgren, E. A., "Assessing Inversion Performance and Uncertainty in Eddy Current Crack Characterization Applications," *Review of Progress in QNDE*, Vol. 34, AIP, vol. 1650, pp. 1873-1883, (2015).
 55. Aldrin, J. C., Annis, C., Sabbagh, H. A., Shell, E. B., Knopp, J., and Lindgren, E. A., "Case Study on NDE Characterization Metrics for Optimization, Validation and Quality Control," *Review of Progress in QNDE*, Vol. 34, AIP, vol. 1650, pp. 845-855, (2015).
 56. Shell, E. B., Aldrin, J. C., Sabbagh, H. A., Sabbagh, E., Murphy, R. K., Mazdiyasni, S., and Lindgren, E. A., "Demonstration of Model-Based Inversion of Electromagnetic Signals for Crack Characterization," *Review of Progress in QNDE*, Vol. 34, AIP, vol. 1650, pp. 484-493, (2015).
 57. Biedermann, E., Jauriqui, L., Aldrin, J. C., Goodlet, B., Pollock, T., Torbet, C., Mazdiyasni, S., "Resonance Ultrasound Spectroscopy Forward Modeling and Inverse Characterization of Nickel-based Superalloys," *Review of Progress in QNDE*, Vol. 34, AIP, vol. 1650, pp. 835-844, (2015).
 58. Hopkins, D., Datuin, M., Aldrin, J. C., Forsyth, D., Warchol, M., and Warchol, L., "Damage Localization Using Ultrasonic Methods in Multi-Layered Metallic Structures," *Review of Progress in QNDE*, Vol. 34, AIP, vol. 1650, pp. 817-826, (2015).
 59. Mooers, R. D., Aldrin, J. C., and Knopp, J. S., "Model the Effects of Core/Coil Size and Defect Length on Eddy Current Response," *Review of Progress in QNDE*, Vol. 34, AIP, vol. 1650, pp. 395-404, (2015).
 60. Mooers, R. D., Aldrin, J. C., and Knopp, J. S., "Realistic Split D Differential Probe Model Validation," *Review of Progress in QNDE*, Vol. 34, AIP, vol. 1650, pp. 385-394, (2015).
 61. Cherry, M. R., Sabbagh, H. A., Aldrin, J. C., Knopp, J., Pilchak, A., "Forward Propagation of Parametric Uncertainties Through Models of NDE Inspection Scenarios," *Review of Progress in QNDE*, Vol. 34, AIP, vol. 1650, pp. 1884-1892, (2015).
 62. Cherry, A. J., Cherry, M. R., Aldrin, J. C., Lindgren, E. A., Sabbagh, H. A., Boehnlein, T., Mooers, R., Knopp, J., "Role of interface conditions in low frequency electromagnetic testing of multilayer structures," *Review of Progress in QNDE*, Vol. 34, AIP, vol. 1650, pp. 377-384, (2015).
 63. Sabbagh, E. H., Sabbagh, H. A., Murphy, R. K., Aldrin, J. C., Annis, C., Knopp, J., "Stochastic Inverse Problems: Models and Metrics," *Review of Progress in QNDE*, Vol. 34, AIP, vol. 1650, pp. 1865-1872, (2015).
 64. Aldrin, J. C., Coughlin, C., Forsyth, D. S., and Welter, J. T., "Progress on the Development of Automated Data Analysis Algorithms and Software for Ultrasonic Inspection of Composites," *Review of Progress in QNDE*, Vol. 33, AIP Conf. Proc. 1581, pp. 1920-1927, (2014).
 65. Aldrin, J. C., Annis, C., Sabbagh, H. A., Knopp, J., and Lindgren, E. A., "Assessing the Reliability of Nondestructive Evaluation Methods for Damage Characterization," *Review of Progress in QNDE*, Vol. 33, AIP Conf. Proc. 1581, pp. 2071-2078, (2014).
 66. Aldrin, J. C., Sabbagh, H. A., Sabbagh, E. H., Murphy, R. K., Keiser, M., Forsyth, D. S., and Lindgren, E. A., "Model-based Inverse Methods for Bolt-holt Eddy Current (BHEC)

- Inspections,” *Review of Progress in QNDE*, Vol. 33, AIP Conf. Proc. 1581, pp. 1433-1440, (2014).
67. Mooers, R. D., Aldrin, J. C., and Knopp, J. S., “Simulated Parametric Study Based on a Representative Split D Differential Eddy Current Probe,” *Review of Progress in QNDE*, Vol. 33, AIP Conf. Proc. 1581, pp. 1344-1351, (2014).
 68. Mooers, R. D., Aldrin, J. C., and Knopp, J. S., “Split D Differential Probe Model Validation Using an Impedance Analyzer,” *Review of Progress in QNDE*, Vol. 33, AIP Conf. Proc. 1581, pp. 1511-1518, (2014).
 69. Sabbagh, H. A., Murphy, R. K., Sabbagh, E. H., Aldrin, J. C., and Knopp, J. S., *Computational Electromagnetics and Model-Based Inversion - A Modern Paradigm for Eddy-Current Nondestructive Evaluation*, Springer, (2013).
 70. Aldrin, J. C., Coughlin, C., Forsyth, D. S., and Welter, J. T., “Automated Data Analysis Algorithms and Software for Ultrasonic Inspection of Composites”, SAMPE 2013, Long Beach, CA, May 6-9, (2013).
 71. Aldrin, J. C., Knopp, J., Sabbagh, H. A., “Bayesian Methods in Probability of Detection Estimation and Model-assisted Probability of Detection (MAPOD) Evaluation,” *Review of Progress in QNDE*, Vol. 32, AIP Conf. Proc. 1511, pp.1733-1740, (2013).
 72. Aldrin, J. C., Knopp, J., “False Call Rate Estimation,” *Review of Progress in QNDE*, Vol. 32, AIP Conf. Proc. 1511, pp.1795-1802, (2013).
 73. Aldrin, J. C., Jauriqui, L., Hunter, L., “Models for Process Compensated Resonant Testing (PCRT) of Silicon Nitride Balls,” *Review of Progress in QNDE*, Vol. 32, AIP Conf. Proc. 1511, pp.1393-1400, (2013).
 74. Aldrin, J. C., Motes, D., Forsyth, D. S., and Steffes, G., “Enhanced Image Processing Methods for GMR Array Inspections of Multilayer Metallic Structures,” *Review of Progress in QNDE*, Vol. 32, AIP Conf. Proc. 1511, pp.699-706, (2013).
 75. Motes, D., Aldrin, J. C., Keiser, M., Steffes, G., and Forsyth, D. S., “GMR Sensing Array Technique Validation Study for the Inspection of Multi-Layer Metallic Structures,” *Review of Progress in QNDE*, Vol. 32, AIP Conf. Proc. 1511, pp.1562-1569, (2013).
 76. Cherry, A., Knopp, J., Aldrin, J. C., Sabbagh, H. A., Boehnlein, T., and Mooers, R., “Role of Varying Interface Conditions on the Eddy Current Response from Cracks in Multilayer Structures,” *Review of Progress in QNDE*, Vol. 32, AIP Conf. Proc. 1511, pp.456-463, (2013).
 77. Cherry, M. R., Aldrin, J. C., Boehnlein, T., and Blackshire, J. L., “A Parallel Mixed 3D Grid/Explicit FEM Scheme for Computing Elastic Wave Propagation on A GPU Using an Irregular Mesh,” *Review of Progress in QNDE*, Vol. 32, AIP Conf. Proc. 1511, pp.75-82, (2013).
 78. Dierken, J., Aldrin, J. C., Holec, R., LaCivita, M., Shearer, J., Lindgren, E., “Progress in Defect Quantification in Multi-layered Structures Using Ultrasonic Inspection,” *Review of Progress in QNDE*, Vol. 32, AIP Conf. Proc. 1511, pp.769-776, (2013).
 79. Sabbagh et al, “Stochastic-integral Models for Propagation-of-uncertainty Problems in Nondestructive Evaluation,” *Review of Progress in QNDE*, Vol. 32, AIP Conf. Proc. 1511, pp.1765-1772, (2013).
 80. Mooers, R. D., Aldrin, J. C., and Knopp, J. S., “Differential Modeling for Benchmarking: TEAM Workshop Problem 8 Revisited,” *Electromagnetic Nondestructive Evaluation*, (Rio de Janario, Brasil, 2012).
 81. Knopp, J. S., Grandhi, R., Zeng, L., and Aldrin, J. C., “Considerations for Statistical Analysis of Nondestructive Evaluation Data: Hit/Miss Analysis,” *E-Journal of Advanced Maintenance*, Japan Society of Maintenance, Vol.4, n 3, 105-115, (2012).
 82. Knopp, J. S., Grandhi, R., Aldrin, J. C., and Park, I., “Statistical Analysis of Eddy Current Data from Fastener Site Inspections,” *Journal of Nondestructive Evaluation*, Vol. 32, n 1, pp 44-50, (2013).
 83. Aldrin, J. C., Medina, E. A., Santiago, J., Lindgren, E. A., Buynak, C., Knopp, J., “Demonstration study for reliability assessment of SHM systems incorporating model-assisted probability of detection approach,” *Review of Progress in QNDE*, Vol. 31, AIP Conf. Proc. 1430, pp.1543-1550, (2012).
 84. Aldrin, J. C., Sabbagh, H. A., Murphy, R. K., Sabbagh, E. H., Knopp, J. S., Lindgren, E. A., Cherry, M. R., “Demonstration of model-assisted probability of detection evaluation

- methodology for eddy current nondestructive evaluation,” *Review of Progress in QNDE*, Vol. 31, AIP Conf. Proc. 1430, pp.1733-1740, (2012).
85. Murphy, R. K., Sabbagh, H. A., Bowler, J. R., Ji, Y., Sabbagh, E. H., Aldrin, J. C., “Advances in developing multiscale flaw models for eddy-current NDE,” *Review of Progress in QNDE*, Vol. 31, AIP Conf. Proc. 1430, pp. 309-315, (2012).
 86. Aldrin, J. C., Medina, E. A., Lindgren, E. A., Buynak, C. F., Knopp, J. S., “Protocol for Reliability Assessment of Structural Health Monitoring Systems Incorporating Model-assisted Probability of Detection (MAPOD) Approach,” Proceedings of the 8th International Workshop on Structural Health Monitoring, Ed. F.-K. Chang, Stanford, CA (September 13-15, 2011).
 87. Medina, E. A., Aldrin, J. C., Santiago, J., Lindgren, E. A., Buynak, C. F., Knopp, J. S., “Demonstration for Reliability Assessment of Structural Health Monitoring Systems Incorporating Model-assisted Probability of Detection Approach,” Proceedings of the 8th International Workshop on Structural Health Monitoring, Ed. F.-K. Chang, Stanford, CA (September 13-15, 2011).
 88. Aldrin, J. C., Medina, E. A., Lindgren, E. A., Buynak, C., Knopp, J., “Case Studies for Model-assisted Probabilistic Reliability Assessment for Structural Health Monitoring Systems”, *Review of Progress in QNDE*, Vol. 30, AIP Conf. Proc. 1335, pp. 1589-1596 (2011).
 89. Aldrin, J. C., Knopp, J. S., Blodgett, M. P., and Sabbagh, H. A., “Uncertainty Propagation in Eddy Current Inverse Problems”, *Review of Progress in QNDE*, Vol. 30, AIP Conf. Proc. 1335, pp. 631-638, (2011).
 90. Aldrin, J. C., Sabbagh, H. A., Murphy, R. K., Sabbagh, E. H., “Recent advances in modeling discontinuities in anisotropic and heterogeneous materials in eddy current NDE”, *Review of Progress in QNDE*, Vol. 30, AIP Conf. Proc. 1335, pp. 1565-1572, (2011).
 91. Mooers, R. D., Cherry, M. R., Knopp, J. S., Aldrin, J. C., Sabbagh, H. A., Boehnlein, T. R., “Low frequency eddy current benchmark study for model validation”, *Review of Progress in QNDE*, Vol. 30, AIP Conf. Proc. 1335, pp. 349-356, (2011).
 92. Cherry, M. R., Mooers, R. D., Knopp, J. S., Aldrin, J. C., Sabbagh, H. A., Boehnlein, T. R., “Low frequency eddy current finite element model validation and benchmark studies”, *Review of Progress in QNDE*, Vol. 30, AIP Conf. Proc. 1335, pp. 357-364, (2011).
 93. Sabbagh, H. A., Murphy, R. K., Sabbagh, E. H., Aldrin, J. C., Johnson, M., “Characterizing and modeling arrays of eddy- current probes,” *Review of Progress in QNDE*, Vol. 30, AIP Conf. Proc. 1335, pp. 341-348, (2011).
 94. Sabbagh, H. A., Murphy, R. K., Sabbagh, E. H., Aldrin, J. C., “Modeling direct and inverse problems in ferritic heat-exchanger tubes,” *Review of Progress in QNDE*, Vol. 30, AIP Conf. Proc. 1335, pp. 365-371, (2011).
 95. Knopp, J. S., Aldrin, J. C., and Blodgett, M. P., “Efficient Propagation of Uncertainty in Simulations Via the Probabilistic Collocation Method”, *Electromagnetic Nondestructive Evaluation (XIV)*, Szczecin, Poland, June 2010 (submitted for publication, 2011).
 96. Aldrin, J. C., Blodgett, M. P., Lindgren, E. A., Steffes, G. J., and Knopp, J. S., “Scattering of obliquely incident shear waves from a cylindrical cavity”, *Journ. Acoust Soc. America*, 129, pp. 3661-3675 (2011).
 97. Judd, D. R., Aldrin, J. C., and Drennen, B., “Ultrasonic technique using secondary signals for blind thickness characterization in multilayer structural joints”, *Materials Evaluation*, Vol. 69, n 5, pp. 585-596, (2011).
 98. Roth, D. J., Tokars, R. P., Martin, R. E., Rauser, R. W., Aldrin, J.C., Schumacher, E.J., “Ultrasonic Phased Array Inspection Experiments and Simulations for an Isogrid Structural Element With Cracks,” *Materials Evaluation*, Vol. 68, n 6, pp. 76-83, (2010).
 99. Forsyth, D. and Aldrin, J. C., “Build Your Own POD”, *4th European-American Workshop on Reliability of NDE, (June 2009, Berlin, Germany)*. Published online at NDT.net: <http://www.ndt.net/article/reliability2009/Inhalt/th3a1.pdf>.
 100. Aldrin, J. C., Blodgett, M. P., Steffes, G., and Lindgren, E. A., “Analytical Model for the Scattering of an Obliquely Incident Plane Shear Wave from a Cylindrical Cavity”, *Review of Progress in QNDE*, Vol. 29, AIP, pp. 81-87, (2010).
 101. Aldrin, J. C., Sabbagh, H. A., Murphy, R. K., Sabbagh, E. H., and Knopp, J. S., “Sensitivity Analysis of Inverse Methods in Eddy Current Pit Characterization”, *Review of Progress in QNDE*, Vol. 29, AIP, pp. 771-718, (2010).

102. Aldrin, J. C., Medina, E. A., Lindgren, E. A., Buynak, C. F., Steffes, G., Derriso, M., "Model-assisted Probabilistic Reliability Assessment for Structural Health Monitoring Systems," *Review of Progress in QNDE*, Vol. 29, AIP, pp. 1965-1972, (2010).
103. Sabbagh, H. A., Murphy, R. K., Sabbagh, E. H., Aldrin, J. C., "Characterizing and modeling ferrite-core probes," *Review of Progress in QNDE*, Vol. 29, AIP, pp. 369-376, (2010).
104. Sabbagh, H. A., Murphy, R. K., Sabbagh, E. H., Knopp, J. S., Aldrin, J. C., and Nyenhuis, J., "Eddy Current Inversion and Estimation Metrics for Evaluating Thermal Barrier Coatings," *Review of Progress in QNDE*, Vol. 29, AIP, pp. 703-710, (2010).
105. Roth, D. J., Tokars, R. P., Martin, R. E., Rauser, R. W., Aldrin, J.C., Schumacher, E.J., "Ultrasonic Phased Array Inspection Experiments and Simulations for an Isogrid Structural Element With Cracks," *Review of Progress in QNDE*, Vol. 29, AIP, pp. 910-917, (2010).
106. Aldrin, J. C., Sabbagh, H. A., Murphy, R. K., Sabbagh, E. H., "Sensitivity Analysis of Pit Characterization Using Inverse Methods," *Electromagnetic Nondestructive Evaluation (XIII)*, Ed. by J. Knopp, M. Blodgett, B. Wincheski, and N. Bowler, Volume 33, pp. 121-128, (2010).
107. Aldrin, J. C., Knopp, J. S., Blodgett, M. P., "Model-based Image Processing in Eddy Current Nondestructive Evaluation," *Electromagnetic Nondestructive Evaluation (XIII)*, Ed. by J. Knopp, M. Blodgett, B. Wincheski, and N. Bowler, Volume 33, pp. 254-261, (2010).
108. Sabbagh, H. A., Murphy, R. K., Sabbagh, E. H., Knopp, J. S., Aldrin, J. C., "Characterizing and Modeling Ferrite-Core Probes," *Electromagnetic Nondestructive Evaluation (XIII)*, Ed. by J. Knopp, M. Blodgett, B. Wincheski, and N. Bowler, Volume 33, pp. 18-25, (2010).
109. Lindgren, E. A., Buynak, C. F., Aldrin, J. C., Median, E. A., Derriso, M. M., "Model-assisted Methods for Validation of Structural Health Monitoring Systems" *Proceedings of the 7th International Workshop on Structural Health Monitoring*, pp. 2188-2195. (2009).
110. Sabbagh, H. A., Murphy, R. K., Sabbagh, E. H., Aldrin, J. C., Knopp, J. S., Blodgett, M., "Computational Electromagnetics and Model-Based Inversion: A Modern Paradigm for Eddy-Current Nondestructive Evaluation," *Applied Computational Electromagnetics Society Journal*, Vol. 24, n. 6, pp. 533-540, (2009).
111. Aldrin, J. C., Sabbagh, H. A., Murphy, R. K., Sabbagh, E. H., "Evaluation of Robustness of Inverse Methods for Pit Characterization," *Inverse Problem Symposium 2009*, East Lansing, Michigan, (2009).
112. Aldrin, J. C., Knopp, J. S., Lindgren, E. A., Sabbagh, H. A., Sabbagh, E. H., Murphy, R. K., "Model-assisted Evaluation of the Reliability of an Eddy Current Nondestructive Evaluation Technique," *The 25th Annual Review of Progress in Applied Computational Electromagnetics Society (ACES)*, Monterey, California, (2009).
113. Sabbagh, H. A., Aldrin, J. C., Murphy, R. K., Sabbagh, "Application of model-based inversion to eddy-current NDE of heat-exchanger tubing," *The 25th Annual Review of Progress in Applied Computational Electromagnetics (ACES)*, Monterey, California, (2009).
114. Sabbagh, H. A., Murphy, R. K., Sabbagh, E. H., Nyenhuis, J., Aldrin, J. C., Knopp, J. S., "Eddy Current Inversion and Estimation Metrics for Evaluating Thermal Barrier Coatings," *The 25th Annual Review of Progress in Applied Computational Electromagnetics (ACES)*, Monterey, California, (2009).
115. Blodgett, M. P., Sabbagh, H. A., Sabbagh, E. H., Murphy, R. K., Knopp, J., Aldrin, J. C., "Computational Models for Material Grain Noise Measurement and Microstructure Characterization," *The 25th Annual Review of Progress in Applied Computational Electromagnetics (ACES)*, Monterey, California, (2009).
116. Aldrin, J. C. Steffes, G., and Knopp, J. S., "Simulation and Automated Data Classification for Eddy Current Inspection of Fastener Sites Using a GMR Sensor Array with Sheet Current Excitation," *Review of Progress in QNDE*, Vol. 28, AIP, pp 342-349, (2009).
117. Aldrin, J. C., Knopp, J. S., Lindgren, E. A., Jata, K. V., "Model-assisted Probability of Detection (MAPOD) Evaluation for Eddy Current Inspection of Fastener Sites," *Review of Progress in QNDE*, Vol. 28, AIP, pp 1784-1791, (2009).
118. Aldrin, J. C., Knopp, J. S., Lindgren, E. A., Jata, K. V., "Model-based Inversion in Eddy Current Image Processing", *Review of Progress in QNDE*, Vol. 28, AIP, pp 719-726, (2009).
119. Aldrin, J. C., Jata, K. V., Lindgren, E. A., Chellapilla, S. S., Medina, E. A., "Analytical Model of the Scattering of Guided Waves from Fastener Sites with a Stiffness Interface," *Review of Progress in QNDE*, Vol. 28, AIP, pp 145-152, (2009).

120. Aldrin, J. C., Williams, P. A., Wincheski, B., "Models in the Design and Validation of Eddy Current Inspection for Cracking in the Shuttle Reaction Control System Thruster," *Review of Progress in QNDE*, Vol. 28, AIP, pp 1862-1869, (2009).
121. Roth D. J., Tokars, R. P., Martin, R. E., Rauser, R. W., Aldrin, J. C., "Ultrasonic phased array simulations of welded components at NASA," *Review of Progress in QNDE*, Vol. 28, AIP, pp 1190-1197, (2009).
122. Murphy, R. K., Sabbagh, H. A., Sabbagh, E. H., Blodgett, M. P., Knopp, J., Aldrin, J. C., "Model development for broadband spiral-coil eddy-current probes," *Review of Progress in QNDE*, Vol. 28, AIP, pp 335-341, (2009).
123. Sabbagh, E. H., Sabbagh, H. A., Murphy, R. K., Sheila-Vadde, A., Blodgett, M. P., Knopp, J., Aldrin, J. C., "Modeling anisotropic grain noise in eddy-current NDE: reliability assessment of inverse problems," *Review of Progress in QNDE*, Vol. 28, AIP, pp 742-749, (2009).
124. Sabbagh, H. A., Aldrin, J. C., Murphy, R. K., Sabbagh, "Application of model-based inversion to eddy-current NDE of heat-exchanger tubing," *Review of Progress in QNDE*, Vol. 28, AIP, pp 735-741, (2009).
125. Knopp, J. S., Aldrin, J. C., and, Jata, K.V., "Computational Methods in Eddy Current Crack Detection at Fastener Sites in Multi-Layer Structures," *Nondestructive Testing and Evaluation*, Vol. 24, n 1-2, pp. 103-120, (March, 2009).
126. Roth D. J., Tokars, R. P., Martin, R. E., Rauser, R. W., Aldrin, J. C., Schumacher, E. J., "Ultrasonic phased array testing simulations of welded components at NASA," *Materials Evaluation*, Vol. 67, n 1, pp. 60-65, (2009).
127. Knopp, J. S., Aldrin, J. C., Sabbagh, H. A., and Jata, K. V., "Estimation Theory Metrics in Electromagnetic NDE", *Electromagnetic Nondestructive Evaluation Workshop Proceedings*, Seoul, Korea, (June 10-12, 2008).
128. Aldrin, J. C. and Knopp, J. S., "Modeling and Simulation for Nondestructive Testing with Applications to Aerospace Structures", *Materials Evaluation*, Vol. 66, n 1, p. 53-59, (2008).
129. Sabbagh, H. A., Murphy, R. K., Sabbagh, E. H., Aldrin, J. C., "Application Of Model-based Inversion to Eddy-Current NDE of Heat-Exchanger Tubing", *Materials Evaluation*, Vol. 66, n 7, pp. 764-774 (2008).
130. Medina, E. A. and Aldrin, J. C., "Value Assessment Approaches for Structural Life Management through SHM", *Encyclopedia of Structural Health Monitoring*, John Wiley & Sons, Ltd. (2009).
131. Sabbagh, H. A., Murphy, R. K., Sabbagh, E. H., Aldrin, J. C., Knopp, J. S., "The Joy of Computing with Volume-Integrals", *The 24th Annual Review of Progress in Applied Computational Electromagnetics*, Niagara Falls, Ontario, Canada, (2008).
132. Chellapilla , S. S., Aldrin, J. C., Jata, K. V., "Interaction of Guided Waves with Fastener Sites in Aircraft Structures", *Proceedings of the 6th International Workshop on Structural Health Monitoring*, pp. 910-918, (2007).
133. Knopp, J. S., and Aldrin, J. C., "Fundamental Feature Extraction Methods for the Analysis of Eddy Current Data," *Electromagnetic Nondestructive Evaluation (ENDE) Conference Proceedings*, Cardiff, Wales, June 19 – 21, 2007.
134. Aldrin, J. C., Medina, E. A., Allwine, D. A., Knopp, J. S., "Tradeoff Analysis Tools For Hybrid NDE-SHM Life Management Strategies" *Aging Aircraft Conference*, Palm Springs, CA, (2007).
135. Lindgren, E., Aldrin, J. C., Jata, K. Scholes, B., Knopp, J., "Ultrasonic Plate Waves for Fatigue Crack Detection in Multi-layered Metallic Structures", *Proc SPIE Int Soc Opt Eng*, Vol. 6532, (2007).
136. Aldrin, J. C., Knopp, J. S., Lindgren, E. A., Annis, C., Sabbagh, H. A., Sabbagh, E. H., Murphy, R. K., "Reliability Demonstration for an Eddy Current NDE Technique Using a Computational Electromagnetic Model-Assisted Approach", *The 23rd Annual Review of Progress in Applied Computational Electromagnetics*, Verona, Italy, (2007).
137. Murphy, R. K., Sabbagh, H. A., Sabbagh, E. H., Aldrin, J. C., Knopp, J. S., Lindgren, E. A., "Clutter Removal and Inversion of Eddy-Current Impedance Data", *The 23rd Annual Review of Progress in Applied Computational Electromagnetics*, Verona, Italy, (2007).
138. Murphy, R. K., Sabbagh, H. A., Sabbagh, E. H., Aldrin, J. C., Lindgren, E. A., Knopp, J. S., "Modeling Pitting and Corrosion Phenomena by Eddy-Current Volume-Integral Equations", *The 23rd Annual Review of Progress in Applied Computational Electromagnetics*, Verona, Italy, (2007).

139. Murphy, R. K., Sabbagh, H. A., Sabbagh, E. H., Aldrin, J. C., Knopp, J. S., "Application of a Volume-Integral Code to Gap + Insert Problems in Aerospace Nondestructive Evaluation", *The 23rd Annual Review of Progress in Applied Computational Electromagnetics*, Verona, Italy, (2007).
140. Roth, D. J., Aldrin, J. C., Seebo, J. P., Trinh, L. B., Walker, J. L., Winfree, W. P., "Chapter 26: Recent Advanced Signal Processing Methods For Waveform-Based NDE Methods", *Ultrasonic and Advanced Methods for Nondestructive Testing and Material Characterization*, edited by C.H. Chen, World Scientific Publishing, (2007), pp. 613-632.
141. Kramb, V.A., Lindgren, E.A., Aldrin, J.C., Kropas-Hughes, C.V., "Aerospace Applications of Ultrasonic Testing", *Nondestructive Testing Handbook, Third Edition: Volume 7, Ultrasonic Testing*, Workman, G. L. (tech. ed.), Kishoni, D. (tech. ed.), Moore, P. O. (ed.), American Society of Nondestructive Testing. Columbus, OH. (2007).
142. Aldrin, J. C., Knopp, J. S., "Case Study for New Feature Extraction Algorithms, Automated Data Classification, and Model-Assisted Probability of Detection Evaluation", *Review of Progress in QNDE*, Vol. 26, AIP, pp 257-264, (2007).
143. Knopp, J. S., Aldrin, J. C., Lindgren, E. A., Annis, C. "Investigation of a Model-Assisted Approach to Probability of Detection Evaluation", *Review of Progress in QNDE*, Vol. 26, AIP, pp. 1775-1782, (2007).
144. Aldrin, J. C., Medina, E. A., Allwine, D. A., QadeerAhmed, M., Fisher, J., Knopp, J. S., Lindgren, E. A., "Probabilistic Risk Assessment: Impact of Human Factors on Nondestructive Evaluation (NDE) and Sensor Degradation on Structural Health Monitoring (SHM)", *Review of Progress in QNDE*, Vol. 26, AIP, pp. 1461-1468, (2007).
145. Lindgren, E. A., Knopp, J. S., Aldrin, J. C., Steffes, G. J., Buynak, C. F. "Aging Aircraft NDE: Capabilities, Challenges, And Opportunities", *Review of Progress in QNDE*, Vol. 26, AIP, pp. 1731-1738, (2007).
146. Aldrin, J. C., Roth, D. J., Seebo, J. P., Winfree, W. P., "Protocol and Assessment of Signal Processing and Feature Extraction Methods for Terahertz NDE For Spray-on Foam Insulation", *Review of Progress in QNDE*, Vol. 26, AIP, pp. 432-439, (2007).
147. Roth, D. J., Seebo, J. P., Trinh, L. B., Walker, J. L., Aldrin, J. C., "Protocol and Assessment of Signal Processing and Feature Extraction Methods for Terahertz NDE For Spray-on Foam Insulation", *Review of Progress in QNDE*, Vol. 26, AIP, pp. 415-424, (2007).
148. Aldrin, J. C., Knopp, J. S., "Crack Characterization Method with Invariance to Noise Features for Eddy Current Inspection of Fastener Sites", *Journal of Nondestructive Evaluation*, Vol. 25, n 4, pp. 165-181, (2006).
149. Knopp, J. S., Aldrin, J. C., Misra, P., "Considerations in the Validation and Application of Models for Eddy Current Inspection of Cracks Around Fastener Holes", *Journal of Nondestructive Evaluation*, Vol. 25, n 3, pp. 123-138, (2006).
150. Aldrin, J. C., Knopp, J. S., Lindgren, E. A., Annis, C. "Model-Assisted Approach to Probability of Detection Evaluation for Structural Applications", *ASNT Fall Conference 2006 Proceedings*, Houston, TX, October 2006, pp. 248-252.
151. Aldrin, J. C., Medina, E. A., Jata, K. V., Knopp, J. S., "Simulation-Based Design of a Guided-Wave Structural Health Monitoring System for a Plate-Stiffener Configuration", *Proceedings of the 3rd European Workshop on Structural Health Monitoring*, pp. 1078-1085, (2006).
152. Medina, E. A., Aldrin, J. C., Knopp, J. S., Allwine, D. A., "Value Assessment Tools for Hybrid NDE-SHM Life Management Strategies", *Proceedings of the 3rd European Workshop on Structural Health Monitoring*, pp. 1027-1034, (2006).
153. Jata, K. V., Knopp, J. S., Aldrin, J. C., Medina, E. A., Lindgren, E. A., "Transitioning from NDE Inspection to Online Structural Health Monitoring – Issues and Challenges", *Proceedings of the 3rd European Workshop on Structural Health Monitoring*, pp. 987-995, (2006).
154. Aldrin, J. C., Kropas-Hughes, C. V., Knopp, J., Mandeville, J. R., Judd, D., Lindgren, E., "Advanced Echo-Dynamic Measures for the Characterisation of Multiple Ultrasonic Signals in Aircraft Structures", *Insight*, Vol. 48, n 3, pp. 144-148, (2006).
155. Aldrin, J. C., Sabbagh, H. A. Sabbagh, E. H., Murphy, R. K., Lindgren, E., Knopp, J., "Strategies for Improving Inverse Methods for Eddy Current NDE Corrosion Characterization", *The 22nd Annual Review of Progress in Applied Computational Electromagnetics*, Miami, FL, (2006).

156. Aldrin, J. C., Knopp, J. S., "Method for Crack Characterization with Noise Invariance for Eddy Current Inspection Of Fastener Sites", *Review of Progress in QNDE*, Vol. 25, AIP, pp. 315-322, (2006).
157. Knopp, J. S., Sabbagh, H.A., Aldrin, J. C., Murphy, R. K., Sabbagh, E. H., Hoffmann, J., "Efficient Solution of Electromagnetic Scattering Problems Using Spatial Decomposition Algorithms", *Review of Progress in QNDE*, Vol. 25, AIP, pp. 299-306, (2006).
158. Aldrin, J. C., Knopp, J. S., Judd, D., Mandeville, J. R., Lindgren, E., "Spiral Creeping Waves in Ultrasonic Angled-Beam Shear Wave Inspection of Fastener Holes In Multilayer Structures", *Review of Progress in QNDE*, Vol. 25, AIP, pp. 187-194, (2006).
159. Aldrin, J. C., Medina, E. A., Knopp, J. S., "Cost Benefit Analysis Incorporating Probabilistic Risk Assessment For Structural Health Monitoring", *Review of Progress in QNDE*, Vol. 25, AIP, pp. 1910-1918, (2006).
160. Aldrin, J. C., Sabbagh, H. A., Sabbagh, E. H., Murphy, R. K., Concordia, M., Judd, D., Lindgren, E., Knopp, J. S., "Methodology Using Inverse Methods for Pit Characterization in Multilayer Structures", *Review of Progress in QNDE*, Vol. 25, AIP, pp. 767-774, (2006).
161. Aldrin, J. C., Medina, E. A., Altynova, M., Kropas-Hughes, C. V., Knopp, J. S., "Strategy and Software Framework for the Integration of QNDE and Product Life Management Design", *Review of Progress in QNDE*, Vol. 24, pp. 1682-1689, (2005).
162. Knopp, J. S., Aldrin, J. C., "Numerical Studies of Eddy Current NDE for Small Crack Detection around Fasteners in Multi-Layer Structures", *Review of Progress in QNDE*, Vol. 24, AIP, pp. 417-424, (2005).
163. Aldrin, J. C., Kropas-Hughes, C. V., Knopp, J., Mandeville, J. R., Judd, D., Lindgren, E., "Advanced Echo-Dynamic Measures for the Characterization of Multiple Ultrasonic Signals in Aircraft Structures", 16th World Conference on Nondestructive Testing, Montreal, Canada, (2004).
164. Knopp, J. S., Aldrin, J. C., Sabbagh, H., Ko, R. T., "Modeling Eddy Current Crack Detection in Multi-Layer Airframe Structures Using the Volume-Integral Method", ACES Conference, Syracuse, NY, (2004).
165. Lindgren, E., Judd, D., Concordia, M., Mandeville, J., Aldrin, J. C., Spencer, F., Fritz, D., Pratt, E., Waldbusser, R., Mullis, R. T., "Validation and Deployment of Automated Ultrasonic Inspections for the C-130 Center Wing," ASIP Conference, Savannah, Georgia, (December 2 - 4 2004).
166. Knopp, J. S., Aldrin, J. C., Sabbagh, H., Ko, R. T., "Numerical and Experimental Study of Eddy Current Crack Detection around Fasteners in Multi-Layer Structures", *Review of Progress in QNDE*, Vol. 23, AIP, pp. 336-343, (2004).
167. Aldrin, J. C., Mandeville, J. R., Kropas-Hughes, C. V., "Ultrasonic Detection of Cracks in a Complex Aircraft Structure Using a Local Correlation Method for Signals from a Moving Transducer", *Review of Progress in QNDE*, Vol. 23, AIP, pp. 565-572, (2004).
168. Aldrin, J. C., Knopp, J. S., Blackshire, J. L., Sathish, S., "Models and Methodology for the Characterization of Surface-Breaking Cracks Using an Ultrasonic Near-Field Scattering Measurement", *Review of Progress in QNDE*, Vol. 23, AIP, pp. 87-94, (2004).
169. Aldrin, J. C., "Computational Methods in Nondestructive Evaluation - Research Strategy and Multidimensional Signal Processing Methods for Feature Classification," Final Report, AFRL-ML-WP-TR-2004-4146, Air Force Research Laboratory, (August 2003).
170. Song, W.-J., Popovics, J. S., Aldrin J. C., Shah, S. P., "Measurement of surface wave transmission coefficient across surface-breaking cracks and notches in concrete," *Journ. Acoust Soc. America*, 113 (2), (2003) pp. 717-725.
171. Aldrin, J., Achenbach, J. D., "Models for Crack Detection in a Cylindrical Hole Containing an Elastic Layer and a Fluid-Filled Cylindrical Hole," *Review of Progress in QNDE*, Vol. 22, p. 181, (2003).
172. Aldrin, J. C., Mandeville, J. R., Judd, D. R., Mullis, R. T., Kropas-Hughes C. V., "Crack Detection for Aircraft Holes with Limited Accessibility Containing Fasteners and Sealant," *Review of Progress in QNDE*, Vol. 22, (2003), p. 173.
173. Eric Lindgren, David Judd, John Mandeville, Tim MacInnis, Michael Concordia, Bartolo Drennen, Robert Grills, John Aldrin, Edward Pratt, Raymond Waldbusser, R. Tommy Mullis,

“Enhanced Nondestructive Evaluation Techniques for the C-130 Center Wing,” Aging Aircraft Conference (2002).

174. Aldrin, J., Achenbach, J. D., “Model and Methodology for Crack Detection on a Cylindrical Hole Containing an Elastic Insert,” *Review of Progress in QNDE*, Vol. 21, p. 181, (2002).
175. Aldrin, J., “Overview of Mathematical Modeling in Nondestructive Evaluation (NDE),” Nondestructive Testing Information Analysis Center, NT-SP-01-03, (2002).
176. Aldrin, J., Achenbach, J. D., Andrew, G., P’an, C., Grills, B., Mullis, R. T., Spencer, F. W., Golis, M., “Case Study for the Implementation of an Automated Ultrasonic Technique to Detect Fatigue Cracks in Aircraft Weep Holes,” *Materials Evaluation*, Vol. 59, n 11, pp.1313-1319, (2001).
177. Aldrin, J., Achenbach, J. D., “Refined Detection of Cracks in Weep Holes Using Spatial Signal Variation,” *Review of Progress in QNDE*, Vol. 20, (2001).
178. Aldrin J., Cheng, A., Achenbach, J. D., Andrew, G., Mullis, R.T., “Detection of Cracks in Weep Holes Using Neural Networks,” *Review of Progress in QNDE*, Vol. 19, p. 1979, (2000).
179. Aldrin, J., Conrad, D. and Soedel, W., “Investigation of Passive and Adaptive Passive Dynamic Absorbers Applied to an Automatic Washer Suspension Design,” *Proc SPIE Int Soc Opt Eng*, Vol. 2720, (1996).

Patents

1. Whah, K. N., Euler, J. W., Pinkowski, R. J., Aldrin, J. C., “Control for an Automatic Washer with Spray Pretreatment,” *US Patent # 6,269,666*, August 7, 2001.
2. Whah, K. N., Euler, J. W., Pinkowski, R. J., Aldrin, J. C., “Control for an Automatic Washer with Spray Pretreatment,” *US Patent # 6,393,872*, May 28, 2002.
3. Whah, K. N., Euler, J. W., Pinkowski, R. J., Aldrin, J. C., “Control for an Automatic Washer with Spray Pretreatment,” *US Patent # 6,584,811*, July 1, 2003.
4. Whah, K. N., Euler, J. W., Pinkowski, R. J., Aldrin, J. C., “Control for an Automatic Washer with Spray Pretreatment,” *US Patent # 6,591,439*, July 15, 2003.

Presentations

1. “Probability of Detection: A Capability Assessment Tool,” Tutorial (with Christine Henry and Matt Cherry), *30th ASNT Research Symposium*, St. Louis, MO, June 2022.
2. “Overview of NDE Simulation and Roles in Digital Twin,” Panel Session on NDE 4.0 and Digital Twin, *12th International Symposium on NDT in Aerospace*, Williamsburg, Virginia (Online), October 2021. [<https://www.ndt.net/search/docs.php3?id=26989>.]
3. “Model-based Inversion Approach for Crack Sizing Addressing Model Discrepancy and Variability in Bolt-hole Eddy Current Inspections”, *Review of Progress in QNDE*, (Online), July 2021.
4. QNDE Industry Panel Session, *ASME QNDE Conference*, (Online), July 2021.
5. “Perspective on Opportunities for SHM Aerospace Applications,” AFRL/RXCA, (Online), April 20, 2021.
6. “Inverse Methods to Characterize Cracks Using Bolt-hole Eddy Current NDE,” *12th International Symposium on NDT in Aerospace*, Williamsburg, Virginia (Online), October 2020.
7. “Simulation of Ultrasonic Inspection of Composites Using CIVA FIDEL,” CIVA North American User Group Meeting, August 19, 2020.
8. “Applications of Modeling in Aerospace NDT: Past, Present and Future,” *11th International Symposium on NDT in Aerospace*, Paris / Saclay, France, November 2019 [Invited Plenary Talk].
9. “Intelligence Augmentation and Human Machine Interface (HMI) Best Practices for NDT 4.0 Reliability,” *ASNT Fall Conference*, Las Vegas, NV, November 2019.
10. “Phased Array Ultrasonic Approach for Characterization of Hidden Region of Impact Damage in Composites,” *Review of Progress in QNDE*, Portland, OR, July 2019.
11. “Modeling of Ultrasonic Spectroscopy for Damage In Multilayer Structures,” *Review of Progress in QNDE*, Portland, OR, July 2019.
12. “Characterization of Micrometeoroid and Orbital Debris (MMOD) Impacts on Space Structures Using Deep Learning Neural Networks (DLNN) Incorporating Experimental and Simulated Data,” *Review of Progress in QNDE*, Portland, OR, July 2019.
13. “Case Study Of Model-assisted Probability of Detection (MAPOD) Evaluation For Manual Ultrasonic Inspection Of Fastener Sites For Fatigue Cracks,” *Review of Progress in QNDE*, Portland, OR, July 2019.

14. "Progress and Challenges of Inverse Methods for Sizing Cracks in Multilayer Bolt-hole Eddy Current Inspections," *ENDE Conference*, Detroit, MI, USA, September 2018.
15. "Demonstration of Using Signal Feature Extraction and Deep Learning Neural Networks with Ultrasonic Data for Detecting Challenging Discontinuities in Composite Panels," *Review of Progress in QNDE*, Burlington, VT, July 2018.
16. "Intelligence Augmentation in Nondestructive Evaluation," *Review of Progress in QNDE*, Burlington, VT, July 2018.
17. "Distinguishing Cracks and Non-metallic Inclusions Using Eddy Current Nondestructive Evaluation and Model-Based Inversion," *Review of Progress in QNDE*, Burlington, VT, July 2018.
18. "Investigations of Pitch-Catch Angled-beam Ultrasonic NDE for Characterization of Hidden Regions of Impact Damage in Composites," *Review of Progress in QNDE*, Burlington, VT, July 2018.
19. "Algorithms in NDT and Best Practices for Operator Interaction," *ASNT Chicago Local Section*, May 2018.
20. "Model-Based Inversion of Eddy Current Nondestructive Evaluation Signals for Cracks and Non-metallic Inclusions," *PS&S 2018 Conference*, Jacksonville, FL, USA, April 2018.
21. "Algorithms in NDT - Past, Future and Best Practices for Operator Interaction and Certification," *ASNT Fall Conference*, Nashville, TN, USA, October 2017.
22. "The Need and Approach for Characterization – US Air Force Perspectives on Materials State Awareness," (joint talk with Eric Lindgren of AFRL), *Review of Progress in QNDE*, Provo UT, USA, July 2017.
23. "Enhanced Model-based Inverse Methods for Sizing Cracks in Multilayer Bolt-hole Eddy Current (BHEC) Inspection," *Review of Progress in QNDE*, Provo UT, USA, July 2017.
24. "Uncertainty Quantification of Resonant Ultrasound Spectroscopy for Material Property and Single Crystal Orientation Estimation on a Complex Part," *Review of Progress in QNDE*, Provo UT, USA, July 2017.
25. "Fundamentals of Angled-beam Ultrasonic NDE for Potential Characterization of Hidden Regions of Impact Damage in Composites," *Review of Progress in QNDE*, Provo UT, USA, July 2017.
26. "Algorithms for NDE Characterization," NASA NSC NDE Technical Discipline Team (TDT), 2017 F2F Meeting @ NASA JSC, January 30, 2017.
27. "Evaluating Crack Sizing Capability of Eddy Current NDE using Model-Based Inversion," ASNT Fall Conference 2016, Long Beach, CA, USA, October 2016.
28. "Model-based Probe State Estimation and Crack Inverse Methods Addressing Eddy Current Probe Variability," *Review of Progress in QNDE*, Minneapolis, MN, USA, July 2016.
29. "Model Benchmarking and Reference Signals for Angled-beam Shear Wave Ultrasonic NDE Inspections," *Review of Progress in QNDE*, Minneapolis, MN, USA, July 2016.
30. "Applications of Modeling and Simulation in Nondestructive Testing," ASNT Chicago Local Section Meeting, November 9 2015.
31. "Certification of Automated Data Analysis Software for the Ultrasonic Inspection of Composite Panels," ASNT Fall Conference 2015, Salt Lake City, UT, October 2015.
32. "Design and Demonstration of Automated Data Analysis Algorithms for Ultrasonic Inspection of Complex Composite Panels with Bonds," *Review of Progress in QNDE*, Minneapolis, MN, USA, July 2015.
33. "Model-based Inverse Methods for Sizing Cracks of Varying Shape and Location in Bolt-hole Eddy Current (BHEC) Inspections," *Review of Progress in QNDE*, Minneapolis, MN, USA, July 2015.
34. "Model-based Inverse Methods for Sizing Surface-breaking Discontinuities with Eddy Current Probe Variability," *Review of Progress in QNDE*, Minneapolis, MN, USA, July 2015.
35. "Best Practices for Evaluating the Capability of Nondestructive Evaluation (NDE) and Structural Health Monitoring (SHM) Techniques for Damage Characterization," *Review of Progress in QNDE*, Minneapolis, MN, USA, July 2015.
36. "Protocol and Demonstration Study for Reliability Assessment of Structural Health Monitoring Systems Incorporating Model-assisted Probability of Detection Approach," 1st International Workshop on SHM Reliability, MIT, Cambridge, MA, USA, April 14 2015.

37. "NDE Characterization Metrics for Optimization, Validation and Quality Control," ASNT Fall Conference 2014, Charleston, SC, October 2014.
38. "Progress on Automated Data Analysis Algorithms for Ultrasonic Inspection of Composites," *Review of Progress in QNDE*, Boise, ID, USA, July 2014.
39. "Case Study on NDE Characterization Metrics for Optimization, Validation and Quality Control," *Review of Progress in QNDE*, Boise, ID, USA, July 2014.
40. "Assessing Inversion Performance and Uncertainty in Eddy Current Crack Characterization Applications," *Review of Progress in QNDE*, Boise, ID, USA, July 2014.
41. "Model-based Inversion Process for Parameter Estimation in Eddy Current Nondestructive Evaluation," ASNT Fall Conference 2013, Las Vegas, NV, November 2013.
42. "Progress of Air Force Program in Automated Data Analysis for Ultrasonic Inspection of Composites," ASNT Fall Conference 2013, Las Vegas, NV, November 2013.
43. "Computational Methods in Nondestructive Evaluation and Structural Health Monitoring," NASA Langley Research Center, Hampton, VA, August 29, 2013.
44. "Progress on the Development of Automated Data Analysis Algorithms and Software for Ultrasonic Inspection of Composites," *Review of Progress in QNDE*, Baltimore, MD, USA, July 2013.
45. "Assessing the Reliability of Nondestructive Evaluation Methods for Damage Characterization," *Review of Progress in QNDE*, Baltimore, MD, USA, July 2013.
46. "Model-based Approach to Multi-parameter Crack, Part and Measurement System State Estimation for the Inspection of Fastener Sites Using Eddy Current NDE," *Review of Progress in QNDE*, Baltimore, MD, USA, July 2013.
47. "Model-based Inverse Methods for Bolt-hole Eddy Current (BHEC) Inspections," *Review of Progress in QNDE*, Baltimore, MD, USA, July 2013.
48. "POD Evaluation Using Models and Simulation," NDE Modeling and Simulation Workshop, *WFNDEC Short Course, Baltimore, MD, USA, July 20, 2013 (with N. Dominguez)*.
49. "Simulation for Innovative NDE Design," NDE Modeling and Simulation Workshop, *WFNDEC Short Course, Baltimore, MD, USA, July 20, 2013*.
50. "Automated Data Analysis Algorithms and Software for Ultrasonic Inspection of Composites", SAMPE 2013, Long Beach, CA, May 6-9, 2013.
51. "Statistical Methods for Quantifying the Performance of Nondestructive Testing Methods for Damage Characterization," *ASNT Fall Conference 2012*, Orlando, FL, October-November 2012.
52. "Model-based Inverse Methods for NDE Aerospace Applications," *ASNT Fall Conference 2012*, Orlando, FL, October-November 2012
53. "False Call Rate Estimation," *Review of Progress in QNDE*, Denver, CO, July 2012.
54. "Bayesian Methods in Probability of Detection Estimation and Model-assisted Probability of Detection (MAPOD) Evaluation," *Review of Progress in QNDE*, Denver, CO, July 2012.
55. "Models for Process Compensated Resonant Testing (PCRT) of Silicon Nitride Balls," *Review of Progress in QNDE*, Denver, CO, July 2012.
56. "Enhanced Image Processing Methods for GMR Array Inspections of Multilayer Metallic Structures," *Review of Progress in QNDE*, Denver, CO, July 2012.
57. "GMR Sensing Array Technique Validation Study for the Inspection of Multi-Layer Metallic Structures," *Review of Progress in QNDE*, Denver, CO, July 2012.
58. "Demonstrations of Model-assisted Probability of Detection (MAPOD) Evaluation", *ASNT Fall Conference 2011*, Palm Springs, CA, October 2011.
59. "Demonstration Study for Reliability Assessment of Structural Health Monitoring Systems Incorporating Model-assisted Probability of Detection Approach", *Review of Progress in QNDE*, Burlington, VT, July 2011
60. "Demonstration of Model-assisted Probability of Detection Evaluation Methodology for Eddy Current NDE", *Review of Progress in QNDE*, Burlington, VT, July 2011
61. "Protocol and Demonstrations of Probabilistic Reliability Assessment for Structural Health Monitoring Systems", *NDCMXII Confernece*, Blacksburg, VA, June 2011
62. "Automated Data Analysis and Model-based Inversion for Material State Characterization", *Aircraft Airworthiness and Sustainment Conference*, San Diego, CA, Apr 2011 (with Harold A. Sabbagh, Jeremy S. Knopp, Mark P. Blodgett, Eric A. Lindgren)

63. "Probabilistic Reliability Assessment Protocol for Structural Health Monitoring (SHM) Systems", *Aircraft Airworthiness and Sustainment Conference*, San Diego, CA, Apr 2011
64. "Recent Progress on Model-assisted Probability of Detection (MAPOD) Evaluation Methodology and Demonstrations", *ASNT Fall Conference*, Houston, TX, Nov 2010
65. "Uncertainty Propagation in Eddy Current Inverse Problems", *Review of Progress in QNDE*, San Diego, CA, July 2010
66. "Case Studies for Model-assisted Probabilistic Reliability Assessment for Structural Health Monitoring Systems", *Review of Progress in QNDE*, San Diego, CA, July 2010.
67. "Application of Ultrasonic Models in Evaluating Crack Signals in Aerospace Structures", *ASNT Fall Conference 2009*, Columbus, OH, October 2009.
68. "Human Factors in Model-assisted POD (MAPOD): Resolution Via Model-Based Inversion", *ASNT Fall Conference 2009*, Columbus, OH, October 2009.
69. "Analytical Model for the Scattering of an Obliquely Incident Plane Shear Wave from a Cylindrical Cavity", *Review of Progress in QNDE*, Kingston, RI, July 2009.
70. "Sensitivity Analysis of Inverse Methods in Eddy Current Pit Characterization", *Review of Progress in QNDE*, Kingston, RI, July 2009.
71. "Model-assisted Probabilistic Reliability Assessment for Structural Health Monitoring Systems", *Review of Progress in QNDE*, Kingston, RI, July 2009.
72. "Sensitivity Analysis of Pit Characterization Using Inverse Methods," 2009 Electromagnetic Nondestructive Evaluation (ENDE) Conference, Dayton, OH, July 2009.
73. "Model-based Image Processing in Eddy Current Nondestructive Evaluation," 2009 Electromagnetic Nondestructive Evaluation (ENDE) Conference, Dayton, OH, July 2009. [poster]
74. "Evaluation of Robustness of Inverse Methods for Pit Characterization," *Inverse Problem Symposium 2009*, East Lansing, MI, June 2009.
75. "Model-assisted Probability of Detection (MAPOD) Evaluation for Reliability Assessment of Nondestructive Evaluation Techniques," *Northwestern University*, Evanston, IL, March 2009.
76. "Model-assisted Evaluation of the Reliability of an Eddy Current Nondestructive Evaluation Technique," *ACES 2009*, Monterey, CA, March 2009.
77. "Sensitivity Analysis for Characterizing Pits Using Eddy Current Techniques with Inverse Methods," *ASNT Fall Conference 2008*, Charleston, SC, November 2008.
78. "Progress on Model-assisted POD (MAPOD) Demonstration Projects for the Air Force," *ASNT Fall Conference 2008*, Charleston, SC, November 2008.
79. "Case Simulation and Automated Data Classification for Eddy Current Inspection of Fastener Sites Using a GMR Sensor Array with Sheet Current Excitation", *Review of Progress in QNDE*, Chicago, IL, July 2008.
80. "Model-assisted Probability of Detection (MAPOD) Evaluation for Eddy Current Inspection of Fastener Sites", *Review of Progress in QNDE*, Chicago, IL, July 2008.
81. "Models in the Design and Validation of Eddy Current Inspection for Cracking in the Shuttle Reaction Control System Thruster", *Review of Progress in QNDE*, Chicago, IL, July 2008.
82. "Model-based Inversion in Eddy Current Image Processing", *Review of Progress in QNDE*, Chicago, IL, July 2008.
83. "Analytical Model of the Scattering of Guided Waves from Fastener Sites with a Stiffness Interface", *Review of Progress in QNDE*, Chicago, IL, July 2008.
84. "Application of Models and Data Analysis Methods to Improve Eddy Current Inspection for Cracks at Fastener Holes with Gaps and Adjacent Fastener Sites," *ASNT Fall Conference 2007*, Las Vegas, NV, November 12-16, 2007.
85. "Automated Ultrasonic Inspection of Fastener Sites in Multilayer Structures for Fatigue Cracks with Variable Angular Location," *ASNT Fall Conference 2007*, Las Vegas, NV, November 2007.
86. "Tradeoff Analysis Tools For Hybrid NDE-SHM Life Management Strategies" *Aging Aircraft Conference*, Palm Springs, CA, April, 2007.
87. "Applications of the Volume Integral Code to Gap + Insert Problems in Aerospace Nondestructive Evaluation," *ACES 2007*, Verona, Italy, March 2007.
88. "Reliability Demonstration for an Eddy Current NDE Technique Using a Computational Electromagnetic Model-Assisted Approach," *ACES 2007*, Verona, Italy, March 2007.
89. "Model-Assisted Approach to Probability of Detection Evaluation for Structural Applications", *ASNT Fall Conference 2006*, Houston, TX, October 2006.

90. "Computational Methods in Nondestructive Evaluation (NDE) with Applications to Automated Design and Reliability Validation", Invited Lecture on Reliability, Whirlpool Corporation, Benton Harbor, MI, October 2006.
91. "Probabilistic Risk Assessment: Impact of Human Factors on Nondestructive Evaluation (NDE) and Sensor Degradation on Structural Health Monitoring (SHM)", Review of Progress in QNDE, Portland, OR, August 2006.
92. "Protocol and Assessment of Signal Processing and Feature Extraction Methods for Terahertz NDE For Spray-on Foam Insulation", *Review of Progress in QNDE*, Portland, OR, August 2006.
93. "Case Study for New Feature Extraction Algorithms, Automated Data Classification, and Model-Assisted Probability of Detection Evaluation", *Review of Progress in QNDE*, Portland, OR, August 2006.
94. "Simulation-Based Design of a Guided-Wave Structural Health Monitoring System for a Plate-Stiffener Configuration", *3rd European Workshop on Structural Health Monitoring*, Granada, Spain, July 2006.
95. "Quantitative NDE and SHM Approaches for Sizing Fatigue Cracks in Aircraft Structures Using Computational Methods," *AeroMat 2006*, Seattle, WA, May 2006.
96. "Strategies for Improving Inverse Methods for Eddy Current NDE Corrosion Characterization," *ACES 2006*, Miami, FL, March 2006.
97. "Exploring Quantitative NDE and SHM Approaches for Sizing Fatigue Cracks in Aircraft Structures using Computational Methods", Seminar to NDE Branch, Materials Directorate, Air Force Research Laboratory, Wright Patterson AFB, November 2005.
98. "Method for Crack Characterization with Noise Invariance for Eddy Current Inspection Of Fastener Sites", *Review of Progress in QNDE*, Brunswick, Maine, August 2005.
99. "Spiral Creeping Waves in Ultrasonic Angled-Beam Shear Wave Inspection of Fastener Holes In Multilayer Structures", *Review of Progress in QNDE*, Brunswick, Maine, August 2005.
100. "Cost Benefit Analysis Incorporating Probabilistic Risk Assessment For Structural Health Monitoring", *Review of Progress in QNDE*, Brunswick, Maine, August 2005.
101. "Methodology Using Inverse Methods for Pit Characterization in Multilayer Structures", *Review of Progress in QNDE*, Brunswick, Maine, August 2005.
102. "Overview of Model-based POD Studies", Model-Assisted POD Working Group meeting, Palm Springs, CA, February 2005.
103. "Model-based Signal Enhancement of Ultrasonic and Eddy Current Data", *ASNT 2004 Fall Conference*, Las Vegas, NV, November 2004.
104. "Advanced Echo-Dynamic Measures for the Characterization of Multiple Ultrasonic Signals in Aircraft Structures", *16th World Conference on Nondestructive Testing*, Montreal, Canada, August 2004.
105. "Strategy and Software Framework for the Integration of QNDE and Product Life Management Design", *Review of Progress in QNDE*, Golden, Colorado, July 2004.
106. "Automated Signal Classification (ASC) in NDE and POD Evaluation", *Workshop on Probability of Detection (POD) Evaluation*, University of Dayton Research Institute, Dayton, Ohio, March 2004.
107. "Enhanced Nondestructive Evaluation Technique for Crack Detection of C-130 Beam Cap Holes", *Aging Aircraft Conference*, New Orleans, Louisiana, September 2003.
108. "Ultrasonic Detection of Cracks in a Complex Aircraft Structure Using a Local Correlation Method for Signals from a Moving Transducer", *Review of Progress in QNDE*, Green Bay, Wisconsin, July 2003
109. "Models and Methodology for the Characterization of Surface-Breaking Cracks Using an Ultrasonic Near-Field Scattering Measurement", *Review of Progress in QNDE*, Green Bay, Wisconsin, July 2003.
110. "Models for Crack Detection in a Cylindrical Hole Containing an Elastic Layer and a Fluid-Filled Cylindrical Hole", *Review of Progress in QNDE*, Bellingham, WA, July 2002.
111. "Crack Detection for Aircraft Holes with Limited Accessibility Containing Fasteners and Sealant," *Review of Progress in QNDE*, Bellingham, WA, July 2002.
112. "The Role of Optimization in Addressing NDE Challenges," *AeroMat 2002*, Orlando, FL, June, 2002.

113. "Automated Signal Classification Development Environment for Nondestructive Evaluation," *ASNT Spring Conference*, Portland, OR, March, 2002.
 114. "Model and Methodology for Crack Detection on a Cylindrical Hole Containing an Elastic Insert," *Review of Progress in QNDE*, Brunswick, ME, August, 2001.
 115. "Refined Detection of Cracks in Weep Holes Using Spatial Signal Variation," *Review of Progress in QNDE*, Ames, IA, July, 2000.
 116. "Detection of Cracks in Weep Holes Using Neural Networks," *3rd Joint DOD/FAA/NASA Conference on Aging Aircraft*, Albuquerque, NM, September, 1999.
 117. "Detection of Cracks in Weep Holes Using Neural Networks," *Review of Progress in QNDE*, Montréal, Québec, Canada, July, 1999.
 118. "Use of the Boundary Element Method for Modeling the Detection of Cracks in Weep Holes," *Mechanics Club – Northwestern University*, Evanston, IL, June, 1999.
 119. "Investigation of Passive and Adaptive Passive Dynamic Absorbers Applied to an Automatic Washer Suspension Design," *Smart Structures and Materials: Passive Damping and Isolation*, SPIE, San Diego, CA, March, 1996.
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Awards and Activities

- 2017 American Society of Nondestructive Testing (ASNT) Fellow.
- 2010 TTCP (The Technical Cooperation Program) Team Achievement Award (for Model-Based Methods for Reducing Cost Associated with POD Studies, with Canada and Australia).
- 2009 NASA Engineering and Safety Center (NESC) Engineering Excellence Award.
- 2006 Young NDT Professional Award (ASNT).
- 2002 Outstanding Paper Award, *Materials Evaluation* (ASNT).
- Associate Technical Editor: *Materials Evaluation* (2013-date)
- Associate Technical Editor: *Journal of Nondestructive Evaluation* (2022-date)
- Guest Editor of Special Issue on Characterization, July 2017, *Materials Evaluation*
- Reviewer: *Journal of Nondestructive Evaluation*, *Ultrasonics*, *Research in Nondestructive Evaluation*, *Structural Health Monitoring*, *NDT & E Int*, *Nondestructive Testing and Evaluation*, *JASA*, *IEEE UFFC*, *IEEE Meas Instr*, *Applied Computational Electromagnetics Society (ACES)*, *ASME JNDE*, *Electromagnetic Nondestructive Evaluation*.
- President - Mechanics Club - Northwestern University (1999-2000 academic year).
- Volunteer Docent - Oriental Institute Museum - University of Chicago (2003 to 2012)

Affiliations

- Member - The American Society of Nondestructive Testing (ASNT)
 - Member – ASNT Reliability Committee (2002 to date)
 - Member – ASNT Research Council (2005 to date)
 - Member – ASNT NDT 4.0 Committee (2019 to date)
- Member - The American Society of Mechanical Engineers (ASME)
 - ASME Boiler and Pressure Vessel (BPV) – Section V (NDE)
 - Member – Resource Development Group (2019 to date)
 - Member – Project Team on Assisted Analysis (2019 to date)
- Member - The Acoustical Society of America (ASA)
- Member - The Institute of Electrical and Electronics Engineers (IEEE)

References provided upon request.