Stanford



Fu-Kuo Chang

Professor of Aeronautics and Astronautics

CONTACT INFORMATION

- **Administrator**

  Renee Quiroz - Administrative Associate

  Email rnquiroz@stanford.edu

  Tel 6507232867;32867

Bio

BIO

Professor Chang's primary research interest is in the areas of multi-functional materials and intelligent structures with particular emphases on structural health monitoring, intelligent self-sensing diagnostics, and multifunctional energy storage composites for transportation vehicles as well as safety-critical assets and medical devices. His specialties include embedded sensors and stretchable sensor networks with built-in self-diagnostics, integrated diagnostics and prognostics, damage tolerance and failure analysis for composite materials, and advanced multi-physics computational methods for multi-functional structures. Most of his work involves system integration and multi-disciplinary engineering in structural mechanics, electrical engineering, signal processing, and multi-scale fabrication of materials. His recent research topics include: Multifunctional energy storage composites, Integrated health management for aircraft structures, bio-inspired intelligent sensory materials for fly-by-feel autonomous vehicles, active sensing diagnostics for composite structures, self-diagnostics for high-temperature materials, etc.

ACADEMIC APPOINTMENTS

- Professor, Aeronautics and Astronautics
- Member, Bio-X

HONORS AND AWARDS

- Life-Time Achievement Award, Society of Prognostic Health Management (2018)
- Life-Time Achievement Award, SPIE NDE/SHM (2010)
- Structural Health Monitoring (SHM) Lifetime Achievement Award, International Workshop on Structural Health Monitoring (2004)
- Fellow, American Institute of Aeronautics and Astronautics (AIAA) (2001)
- Fellow, American Society of Mechanical Engineers (ASME) (1998)
- Presidential Young Investigator Award, National Science Foundation (1988)

BOARDS, ADVISORY COMMITTEES, PROFESSIONAL ORGANIZATIONS

- Co-founder and chair, Aerospace Industry Steering Committee on Structural Health Monitoring (AISC-SHM) (2006 - 2008)
- member, US Army Research Laboratories Advisory Board (2014 - 2017)

- Chair and organizer, International Workshop on Structural Health Monitoring (1997 - present)
- Editor-in-Chief, Int. J. of Structural Health Monitoring (2012 - present)
- Associate Editor, AIAA Journal (2024 - present)

PROFESSIONAL EDUCATION

- PhD, Michigan (1983)

LINKS

- Structures and Composites (SACL) laboratory: https://sacld8.sites.stanford.edu/

Teaching

COURSES

2026-27

- Analysis of Structures: AA 240 (Win)
- Mechanics of Composites: AA 256 (Aut)
- Structural Health Monitoring: AA 257 (Spr)

2025-26

- Analysis of Structures: AA 240 (Win)
- Mechanics of Composites: AA 256 (Aut)
- Structural Health Monitoring: AA 257 (Spr)

2024-25

- Analysis of Structures: AA 240 (Win)
- Mechanics of Composites: AA 256 (Aut)
- Structural Health Monitoring: AA 257 (Spr)

2023-24

- Analysis of Structures: AA 240 (Win)
- Mechanics of Composites: AA 256 (Aut)
- Structural Health Monitoring: AA 257 (Spr)

STANFORD ADVISEES

Postdoctoral Faculty Sponsor

Tanay Topac

Doctoral Dissertation Advisor (AC)

Enquan Chew, Jerry Liu

Master's Program Advisor

Ben Gietzen, Jason Gunn, Tasman Moskowitz, Saketh Vegunta, Av Verma, Rachel Ye

Publications

PUBLICATIONS

- **Frequency- and Path-Dependent Guided-Wave Sensitivity Assessment of an Aerospace-Type Sandwich Composite Floor Panel Under Bonded Patch-Induced Perturbations Using Piezoelectric Sensor Networks** *ELECTRONICS*

Koyuturk, Y., Altay, O., Chang, F., Yadav, S., Kurt, S.
2026; 15 (16)

- **Structural Power Composites Based on High Mass Loading Zn-Ion Hybrid Supercapacitors with Metal Mesh Current Collectors and Aramid Nanofiber/Glass Fiber Composite Electrolytes** *ADVANCED FUNCTIONAL MATERIALS*
  Choi, Y., Shin, G., Lee, H., Nam, E., So, B., Yun, S., Chang, F., Jeon, J., Kang, T.
  2026
- **Domain adaptive relational graph convolutional network for monitoring transverse matrix cracks across composite structures** *STRUCTURAL HEALTH MONITORING-AN INTERNATIONAL JOURNAL*
  Xu, X., Liu, C., Topac, T., Chang, F.
  2026
- **Dynamic Stability Analysis of High-Speed Maglev Vehicle-Guideway Systems in Turbulent Crosswinds** *INTERNATIONAL JOURNAL OF STRUCTURAL STABILITY AND DYNAMICS*
  Zhang, Z., Huang, J., Chang, F., Yan, X., Zhang, X.
  2026
- **Roadmap: Integrating artificial intelligence in structural health monitoring systems** *MEASUREMENT SCIENCE AND TECHNOLOGY*
  Laflamme, S., Blasch, E., Ubertini, F., Liu, Z., Wertz, J., Knott, C., Cherry, M., Lindgren, E., Chang, F., Kumar, A., Poole, J., Worden, K., Downey, et al
  2026; 37 (10)
- **Super-Turing synaptic resistor circuits for intelligent morphing wing.** *Communications engineering*
  Deo, A., Lee, J., Gao, D., Shenoy, R., Haughn, K. P., Rong, Z., Hei, Y., Qiao, D., Topac, T., Chang, F. K., Inman, D. J., Chen, Y.
  2025; 4 (1): 109
- **Autoregressive model-based parameter correlation for state of charge and state of health of lithium-ion batteries using built-in piezoelectric transducer induced ultrasonic waves** *JOURNAL OF ENERGY STORAGE*
  Ahmed, S., Farhangdoust, S., Chang, F.
  2025; 114
- **Thermo-mechanical properties of shape-recoverable structural composites via vacuum-assisted resin transfer molding process and in-situ polymerization of poly (tert-butyl acrylate-co-acrylic acid) copolymer** *COMPOSITES PART A-APPLIED SCIENCE AND MANUFACTURING*
  Jeon, J., So, B., Choi, Y., Han, Y., Kim, T., Shin, G., Lee, J., Kim, H., Kim, J., Farhangdoust, S., Chang, F., Kim, M., Lee, et al
  2024; 185
- **Design and Manufacture of Multifunctional 3-D Smart Skins with Embedded Sensor Networks for Robotic Applications.** *Sensors (Basel, Switzerland)*
  Ransom, E., Chen, X., Mangram, W., Nasrollahi, A., Topac, T., Chang, F. K.
  2024; 24 (11)
- **Fly-by-Feel: Learning Aerodynamics from Multimodal Wing Mechanics**
  Topac, T., Gray, C., Chang, F., AIAA
  AMER INST AERONAUTICS & ASTRONAUTICS.2024
- **GUIDED-WAVE STRUCTURAL HEALTH MONITORING FOR ASSESSING THE BOND STRENGTH OF INDUCTION-WELDED THERMOPLASTIC COMPOSITE JOINTS**
  Mazzeschi, M., Farhangdoust, S., Ahmed, S., Cariibano, E., Fernandez, M., Chang, F., AMER SOC MECHANICAL ENGINEERS
  AMER SOC MECHANICAL ENGINEERS.2024
- **Design of Active Sensing Smart Skin for Incipient Slip Detection in Robotics Applications** *IEEE-ASME TRANSACTIONS ON MECHATRONICS*
  Liu, C., Huh, T., Chen, S. X., Lu, L., Kopsaftopoulos, F., Cutkosky, M. R., Chang, F.
  2022
- **Enabling self-shape estimation of composite structures using distributed microfabricated strain gauge networks** *JOURNAL OF COMPOSITE MATERIALS*
  Chen, X., Nasrollahi, A., Ransom, E., Topac, T., Chang, F.
  2022

- **Si-based self-programming neuromorphic integrated circuits for intelligent morphing wings** *JOURNAL OF COMPOSITE MATERIALS*
  Nathan, D., Deo, A., Haughn, K., Yi, S., Lee, J., Gao, D., Shenoy, R., Xu, M., Tran, I. C., Zheng, J., Rong, Z., Wang, M., Shaffer, et al
  2022
- **Hybrid Models for Situational Awareness of an Aerial Vehicle from Multimodal Sensing** *AIAA JOURNAL*
  Topac, O., Ha, S., Chen, X., Gamble, L., Inman, D., Chang, F.
  2022
- **Warped Gaussian processes for predicting the degradation of aerospace structures** *STRUCTURAL HEALTH MONITORING-AN INTERNATIONAL JOURNAL*
  Pfingstl, S., Braun, C., Nasrollahi, A., Chang, F., Zimmermann, M.
  2022
- **A systematic approach to resolve high impedance of multifunctional energy storage composites** *JOURNAL OF ENERGY STORAGE*
  Bombik, A., Ha, S., Nasrollahi, A., Chang, F.
  2022; 54
- **Design of a Robust Tool for Deploying Large-Area Stretchable Sensor Networks from Microscale to Macroscale.** *Sensors (Basel, Switzerland)*
  Ransom, E., Chen, X., Chang, F.
  2022; 22 (13)
- **Numerical and experimental evaluation of mechanical performance of the multifunctional energy storage composites** *JOURNAL OF COMPOSITE MATERIALS*
  Wang, Y., Chang, F.
  2021
- **Kirigami auxetic structure for high efficiency power harvesting in self-powered and wireless structural health monitoring systems** *SMART MATERIALS AND STRUCTURES*
  Farhangdoust, S., Georgeson, G., Ihn, J., Chang, F.
  2021; 30 (1)
- **MECHANICAL-ELECTRICAL BEHAVIOR OF MULTIFUNCTIONAL ENERGY STORAGE COMPOSITES**
  Bombik, A., Ha, S., Nasrollahi, A., Haider, M., Chang, F., Amer Soc Mech Engineers
  AMER SOC MECHANICAL ENGINEERS.2021
- **Li-ion Battery Health Estimation Using Ultrasonic Guided Wave Data and an Extended Kalman Filter**
  Bombik, A., Ha, S., Haider, M., Nasrollahi, A., Chang, F., IEEE
  IEEE.2021: 962-966
- **Reliability of crack quantification via acousto-ultrasound active-sensing structural health monitoring using surface-mounted PZT actuators/sensors** *STRUCTURAL HEALTH MONITORING-AN INTERNATIONAL JOURNAL*
  Yadav, S., Mishra, S., Kopsaftopoulos, F., Chang, F.
  2020
- **Design and Integration of a Wireless Stretchable Multimodal Sensor Network in a Composite Wing.** *Sensors (Basel, Switzerland)*
  Chen, X., Maxwell, L., Li, F., Kumar, A., Ransom, E., Topac, T., Lee, S., Faisal Haider, M., Dardona, S., Chang, F.
  2020; 20 (9)
- **Static Tactile Sensing for a Robotic Electronic Skin via an Electromechanical Impedance-Based Approach.** *Sensors (Basel, Switzerland)*
  Liu, C. n., Zhuang, Y. n., Nasrollahi, A. n., Lu, L. n., Haider, M. F., Chang, F. K.
  2020; 20 (10)
- **Multifunctional energy storage composite structures with embedded lithium-ion batteries** *JOURNAL OF POWER SOURCES*
  Ladpli, P., Nardari, R., Kopsaftopoulos, F., Chang, F.
  2019; 414: 517–29
- **A Self-Adaptive 1D Convolutional Neural Network for Flight-State Identification.** *Sensors (Basel, Switzerland)*
  Chen, X., Kopsaftopoulos, F., Wu, Q., Ren, H., Chang, F.
  2019; 19 (2)

- **A Self-Adaptive 1D Convolutional Neural Network for Flight-State Identification** *SENSORS*
  Chen, X., Kopsaftopoulos, F., Wu, Q., Ren, H., Chang, F.
  2019; 19 (2)

- **Active Sensing for Measuring Contact of Thin Film Gecko-Inspired Adhesives** *IEEE ROBOTICS AND AUTOMATION LETTERS*
  Tae Myung Huh, Liu, C., Hashizume, J., Chen, T. G., Suresh, S. A., Chang, F., Cutkosky, M. R.
  2018; 3 (4): 3263–70

- **Characterization of Distributed Microfabricated Strain Gauges on Stretchable Sensor Networks for Structural Applications** *SENSORS*
  Chen, X., Topac, T., Smith, W., Ladpli, P., Liu, C., Chang, F.
  2018; 18 (10)

- **Characterization of Distributed Microfabricated Strain Gauges on Stretchable Sensor Networks for Structural Applications.** *Sensors (Basel, Switzerland)*
  Chen, X., Topac, T., Smith, W., Ladpli, P., Liu, C., Chang, F.
  2018; 18 (10)

- **Integrity monitoring of adhesively bonded joints via an electromechanical impedance-based approach** *STRUCTURAL HEALTH MONITORING-AN INTERNATIONAL JOURNAL*
  Zhuang, Y., Kopsaftopoulos, F., Dugnani, R., Chang, F.
  2018; 17 (5): 1031–45

- **Functionalization of stretchable networks with sensors and switches for composite materials** *STRUCTURAL HEALTH MONITORING-AN INTERNATIONAL JOURNAL*
  Guo, Z., Kim, K., Salowitz, N., Lanzara, G., Wang, Y., Peumans, P., Chang, F.
  2018; 17 (3): 598–623

- **Flight State Identification of a Self-Sensing Wing via an Improved Feature Selection Method and Machine Learning Approaches** *SENSORS*
  Chen, X., Kopsaftopoulos, F., Wu, Q., Ren, H., Chang, F.
  2018; 18 (5)

- **Estimating state of charge and health of lithium-ion batteries with guided waves using built-in piezoelectric sensors/actuators** *JOURNAL OF POWER SOURCES*
  Ladpli, P., Kopsaftopoulos, F., Chang, F.
  2018; 384: 342–54

- **Flight State Identification of a Self-Sensing Wing via an Improved Feature Selection Method and Machine Learning Approaches.** *Sensors (Basel, Switzerland)*
  Chen, X., Kopsaftopoulos, F., Wu, Q., Ren, H., Chang, F.
  2018; 18 (5)

- **Estimating Lithium-ion Battery State of Charge and Health with Ultrasonic Guided Waves Using an Efficient Matching Pursuit Technique**
  Ladpli, P., Liu, C., Kopsaftopoulos, F., Chang, F., IEEE
  IEEE.2018

- **A stochastic global identification framework for aerospace structures operating under varying flight states** *MECHANICAL SYSTEMS AND SIGNAL PROCESSING*
  Kopsaftopoulos, F., Nardari, R., Li, Y., Chang, F.
  2018; 98: 425-447

- **Design and analysis of radially polarized screen-printed piezoelectric transducers** *JOURNAL OF INTELLIGENT MATERIAL SYSTEMS AND STRUCTURES*
  Salowitz, N. P., Kim, S., Kopsaftopoulos, F., Li, Y., Chang, F.
  2017; 28 (7): 934-946

- **Analytical model of lap-joint adhesive with embedded piezoelectric transducer for weak bond detection** *JOURNAL OF INTELLIGENT MATERIAL SYSTEMS AND STRUCTURES*
  Dugnani, R., Chang, F.
  2017; 28 (1): 124-140

- **Battery charge and health state monitoring via ultrasonic guided-wave-based methods using built-in piezoelectric transducers**

Ladpli, P., Kopsaftopoulos, F., Nardari, R., Chang, F.
edited by Meyendorf, N. G.
SPIE-INT SOC OPTICAL ENGINEERING.2017

- **Stand-Alone Stretchable Absolute Pressure Sensing System for Industrial Applications** *IEEE Transactions on Industrial Electronics*
  Guo, Y., Schütz, S., Vaghi, A., Li, Y., Guo, Z., Chang, F., Barrettino, D., Wang, S. X.
  2017; 64 (11): 8739-8746

- **Adhesive bond-line degradation detection via a cross-correlation electromechanical impedance-based approach** *STRUCTURAL HEALTH MONITORING-AN INTERNATIONAL JOURNAL*
  Dugnani, R., Zhuang, Y., Kopsaftopoulos, F., Chang, F.
  2016; 15 (6): 650-667

- **A Super Stretchable Organic Thin-Film Diodes Network That Can Be Embedded Into Carbon Fiber Composite Materials for Sensor Network Applications** *JOURNAL OF MICROELECTROMECHANICAL SYSTEMS*
  Guo, Z., Aboudi, U., Peumans, P., Howe, R. T., Chang, F.
  2016; 25 (3): 524-532

- **Monitoring fatigue-induced transverse matrix cracks in laminated composites using built-in acousto-ultrasonic techniques** *STRUCTURAL HEALTH MONITORING-AN INTERNATIONAL JOURNAL*
  Wilson, C. L., Chang, F. K.
  2016; 15 (3): 335-350

- **Damage detection sensitivity characterization of acousto-ultrasound-based structural health monitoring techniques** *STRUCTURAL HEALTH MONITORING-AN INTERNATIONAL JOURNAL*
  Janapati, V., Kopsaftopoulos, F., Li, F., Lee, S. J., Chang, F.
  2016; 15 (2): 143-161

- **Bio-Inspired Stretchable Absolute Pressure Sensor Network.** *Sensors*
  Guo, Y., Li, Y., Guo, Z., Kim, K., Chang, F., Wang, S. X.
  2016; 16 (1)

- **A Self-Diagnostic Adhesive for Monitoring Bonded Joints in Aerospace Structures**
  Zhuang, Y., Li, Y., Kopsaftopoulos, F., Chang, F.
  edited by Lynch, J. P.
  SPIE-INT SOC OPTICAL ENGINEERING.2016

- **MULTIFUNCTIONAL ENERGY STORAGE COMPOSITES DESIGN, FABRICATION, AND EXPERIMENTAL CHARACTERIZATION**
  Ladpli, P., Nardari, R., Rewari, R., Liu, H., Slater, M., Kepler, K., Wang, Y., Kopsaftopoulos, F., Chang, F., ASME
  AMER SOC MECHANICAL ENGINEERS.2016

- **Stochastic Global Identification of a Bio-inspired Self-sensing Composite UAV Wing viaWindTunnel Experiments**
  Kopsaftopoulos, F., Nardari, R., Li, Y., Wang, P., Chang, F.
  edited by Kundu, T.
  SPIE-INT SOC OPTICAL ENGINEERING.2016

- **Electromagnetic Navigation Linear Displacement Transducer Based on Magnetic Field Gradient Technique** *IEEE TRANSACTIONS ON MAGNETICS*
  Zhang, M., Or, S. W., Wang, S., Chang, F.
  2015; 51 (11)

- **Load monitoring and compensation strategies for guided-waves based structural health monitoring using piezoelectric transducers** *JOURNAL OF SOUND AND VIBRATION*
  Roy, S., Ladpli, P., Chang, F.
  2015; 351: 206-220

- **Ultrasonic guided wave active sensing for monitoring of split failures in reinforced concrete** *STRUCTURAL HEALTH MONITORING-AN INTERNATIONAL JOURNAL*
  Wu, F., Chan, H., Chang, F.
  2015; 14 (5): 439-448

- **Linearly dispersive signal construction of Lamb waves with measured relative wavenumber curves** *SENSORS AND ACTUATORS A-PHYSICAL*
  Cai, J., Yuan, S., Qing, X. P., Chang, F., Shi, L., Qiu, L.
  2015; 221: 41-52

- **STATE-SENSING AND AWARENESS FOR A BIO-INSPIRED INTELLIGENT COMPOSITE UAV WING**
  Kopsaftopoulos, F., Nardari, R., Li, Y., Wang, P., Chang, F.
  edited by Thomsen, O. T., Berggreen, C., Sorensen, B. F.
  AALBORG UNIV PRESS.2015

- **Design of intelligent composites with life-cycle health management capabilities**
  Rosania, C. L., Larrosa, C. C., Chang, F.
  edited by Kundu, T.
  SPIE-INT SOC OPTICAL ENGINEERING.2015

- **Bondline Integrity Monitoring of Adhesively Bonded Structures via an Electromechanical Impedance Based Approach**
  Zhuang, Y., Kopsaftopoulos, F., Chang, F.
  edited by Chang, F. K., Kopsaftopoulos, F.
  DESTECH PUBLICATIONS, INC.2015: 187-197

- **Experimental Identification of Structural Dynamics and Aeroelastic Properties of a Self-sensing Smart Composite Wing**
  Kopsaftopoulos, F., Nardari, R., Li, Y., Wang, P., Ye, B., Chang, F.
  edited by Chang, F. K., Kopsaftopoulos, F.
  DESTECH PUBLICATIONS, INC.2015: 1299-1311

- **Multifunctional Energy Storage Composites for SHM Distrubuted Sensor Networks**
  Ladpli, P., Nardari, R., Wang, Y., Hernandez-Gallegos, P., Rewari, R., Kuo, H., Kopsaftopoulos, F., Kepler, K. D., Lopez, H. A., Chang, F.
  edited by Chang, F. K., Kopsaftopoulos, F.
  DESTECH PUBLICATIONS, INC.2015: 2217-2226

- **Decision Making for Reference-Free Damage Detection**
  Hajrya, R., Kopsaftopoulos, F., Roy, S., Ladpli, P., Chang, F.
  edited by Chang, F. K., Kopsaftopoulos, F.
  DESTECH PUBLICATIONS, INC.2015: 2964-2971

- **On-line updating Gaussian mixture model for aircraft wing spar damage evaluation under time-varying boundary condition** *SMART MATERIALS AND STRUCTURES*
  Qiu, L., Yuan, S., Chang, F., Bao, Q., Mei, H.
  2014; 23 (12)

- **Recent advancements and vision toward stretchable bio-inspired networks for intelligent structures** *STRUCTURAL HEALTH MONITORING-AN INTERNATIONAL JOURNAL*
  Salowitz, N., Guo, Z., Roy, S., Nardari, R., Li, Y., Kim, S., Kopsaftopoulos, F., Chang, F.
  2014; 13 (6): 609-620

- **Trends on research in structural health monitoring** *STRUCTURAL HEALTH MONITORING-AN INTERNATIONAL JOURNAL*
  Guemes, A., Salowitz, N., Chang, F.
  2014; 13 (6): 579-580

- **Microfabricated Expandable Sensor Networks for Intelligent Sensing Materials** *IEEE SENSORS JOURNAL*
  Salowitz, N. P., Guo, Z., Kim, S., Li, Y., Lanzara, G., Chang, F.
  2014; 14 (7): 2138-2144

- **A novel physics-based temperature compensation model for structural health monitoring using ultrasonic guided waves** *STRUCTURAL HEALTH MONITORING-AN INTERNATIONAL JOURNAL*
  Roy, S., Lonkar, K., Janapati, V., Chang, F.
  2014; 13 (3): 321-342

- **In situ damage classification for composite laminates using Gaussian discriminant analysis** *STRUCTURAL HEALTH MONITORING-AN INTERNATIONAL JOURNAL*

Larrosa, C., Lonkar, K., Chang, F.
2014; 13 (2): 190-204

- **Modeling of piezo-induced ultrasonic wave propagation in composite structures using layered solid spectral element** *STRUCTURAL HEALTH MONITORING-AN INTERNATIONAL JOURNAL*
  Lonkar, K., Chang, F.
  2014; 13 (1): 50-67

- **Bio-inspired stretchable network-based intelligent composites** *JOURNAL OF COMPOSITE MATERIALS*
  Salowitz, N., Guo, Z., Li, Y., Kim, K., Lanzara, G., Chang, F.
  2013; 47 (1): 97-105

- **Development of SEM-Based PESEA Code for Modeling PZT Induced Acousto-Ultrasonic Waves Propagating in Metallic and Composite Structures**
  Lonkar, K., Chang, F.
  edited by Chang, F. K.
  DESTECH PUBLICATIONS, INC.2013: 2512-2520

- **Screen Printed Piezoceramic Actuators/Sensors Microfabricated on Organic Films and Stretchable Networks**
  Salowitz, N., Guo, Z., Kim, S., Li, Y., Lanzara, G., Chang, F.
  edited by Chang, F. K.
  DESTECH PUBLICATIONS, INC.2013: 1543-1550

- **Monitoring Transverse Matrix Cracking in Composite Laminates Using Ultrasonic Guided Waves**
  Larrosa, C., Chang, F.
  edited by Chang, F. K.
  DESTECH PUBLICATIONS, INC.2013: 1795-1804

- **Sensor Network Configuration Effect on Detection Sensitivity of an Acousto-Ultrasound-Based Active SHM System**
  Janapati, V., Kopsaftopoulos, F., Roy, S., Mueller, I., Lee, S. J., Ladpli, P., Chang, F.
  edited by Chang, F. K.
  DESTECH PUBLICATIONS, INC.2013: 2147-+

- **Structural Damage Detection Using Ultrasonic Guided Waves Under Varying Ambient Temperature and Loading Environments** *9th International Workshop on Structural Health Monitoring (IWSHM)*
  Roy, S., Ladpli, P., Lonkar, K., Chang, F.
  DESTECH PUBLICATIONS, INC.2013: 1284–1293

- **Bio-Inspired Smart Skin Based on Expandable Network** *8th International Workshop on Structural Health Monitoring*
  Guo, Z., Kim, K., Lanzara, G., Salowitz, N., Peumans, P., Chang, F.
  DESTECH PUBLICATIONS, INC.2013: 1717–1723

- **On the Performance Quantification of Active Sensing SHM Systems Using Model-Assisted POD Methods** *8th International Workshop on Structural Health Monitoring*
  Mueller, I., JANAPATI, V., Banerjee, S., Lonkar, K., Roy, S., Chang, F.
  DESTECH PUBLICATIONS, INC.2013: 2417–2428

- **A Vision on Stretchable Bio-Inspired Networks for Intelligent Structures** *9th International Workshop on Structural Health Monitoring (IWSHM)*
  Salowitz, N., Guo, Z., Roy, S., Nardari, R., Li, Y., Kim, S., Kopsaftopoulos, F., Chang, F.
  DESTECH PUBLICATIONS, INC.2013: 35–44

- **Sensor Network Configuration Effect on Detection Sensitivity of an Acousto-Ultrasound-based Active SHM System**
  Janapati, V., Kopsaftopoulos, F., Roy, S., Mueller, I., Lee, S., J., Ladpli, P., Chang, F.
  2013

- **Development of High Performance BS-PT Based Piezoelectric Transducer for Structural Health Monitoring of High-Temperature Polymer-Matrix Composite Structures**
  Li, Y. -H., Kim, S. -J., Nardari, R., Oropeza, D., Chang, F. -K
  2013

- **Screen Printed Piezoceramic Actuators/Sensors Microfabricated on Organic Films and Stretchable Networks**
  Salowitz, N., Guo, Z., Kim, S. -J., Li, Y. -H, Lanzara, G., Chang, F. -K
  2013
- **Monitoring Transverse Matrix Cracking in Composite Laminates Using Ultrasonic Guided Waves**
  Larrosa, C., Chang, F. -K
  2013
- **Structural damage detection using ultrasonic guided waves under varying ambient temperature and loading environments**
  Roy, S., Ladpli, P., Lonkar, P., Chang, F. -K
  2013
- **A vision on stretchable bio-inspired networks for intelligent structures**
  Salowitz, N., Guo, Z., Roy, S., Nardari, R., Li, Y. -H, Kopsaftopoulos, F., Chang, F.
  2013
- **A structural health monitoring fastener for tracking fatigue crack growth in bolted metallic joints** *STRUCTURAL HEALTH MONITORING-AN INTERNATIONAL JOURNAL*
  Rakow, A., Chang, F.
  2012; 11 (3): 253-267
- **Bio-inspired intelligent sensing materials for fly-by-feel autonomous vehicles** *11th IEEE Sensors Conference*
  Salowitz, N., Guo, Z., Kim, S., Li, Y., Lanzara, G., Chang, F.
  IEEE.2012: 363–365
- **Real-time prediction of impact-induced damage for composite structures based on failure analysis and efficient database methods**
  Roy, S., Mueller, I., Janapati, V., Das, S., Chang, F. -K
  2012
- **A Model-assisted Integrated Diagnostics for Structural Health Monitoring**
  Lonkar, K., Janapati, V., Roy, S., Chang, F. -K
  2012
- **Bio-inspired intelligent sensing materials for fly-by-feel autonomous vehicles**
  Salowitz, N., Guo, Z., Kim, S., J., Li, Y. -H, Lanzara, G., Chang, F. -K
  2012
- **Real time in-situ damage classification, quantification and diagnosis for composite structures**
  Larrosa, C., Chang, F. -K
  2012
- **Strain/Elongation Sensitive Metal-Coated Polyimide Microwires for Micro-Scaled Highly Expandable Sensor Networks**
  Lanzara, G., Guo, Z., Salowitz, N., Chang, F. -K
  2012
- **Design of Optimal Layout of Active Sensing Diagnostic Network for Achieving Highest Damage Detection Capability in Structures**
  Janapati, V., Lonkar, K., Chang, F., K.
  2012
- **STRUCTURAL HEALTH MONITORING OF HIGH TEMPERATURE COMPOSITES** *ASME International Mechanical Engineering Congress and Exposition (IMECE)*
  Salowitz, N., Li, Y., Kim, S., Roy, S., Chang, F.
  AMER SOC MECHANICAL ENGINEERS.2012: 273–280
- **Real-time prediction of impact-induced damage for composite structures based on failure analysis and efficient database methods** *Conference on Health Monitoring of Structural and Biological Systems*
  Roy, S., Mueller, I., Janapati, V., Das, S., Chang, F.
  SPIE-INT SOC OPTICAL ENGINEERING.2012
- **A dynamic crash model for energy absorption in braided composite materials - Part II: Implementation and verification** *JOURNAL OF COMPOSITE MATERIALS*

Flesher, N. D., Chang, F., Janapala, N. R., Starbuck, J. M.
2011; 45 (8): 867-882

- **A dynamic crash model for energy absorption in braided composite materials. Part I: Viscoplastic material model** *JOURNAL OF COMPOSITE MATERIALS*
  Flesher, N. D., Chang, F., Janapala, N. R.
  2011; 45 (8): 853-865
- **Bio-Inspired Smart Skin Based on Expandable Network**
  Guo, Z., Kim, K., Lanzara, G., Salowitz, N., Peumans, P., Chang, F. -K
  2011
- **Characterization of temperature, load and damage effects using piezo-electric transducer patches based on fuzzy clustering**
  Lopes, V., Gonsalez, C., da Silva, S., Roy, S., Kode, K., Sunor, F., Chang, F.
  2011
- **Development of SEM-based PESEA Code for Modeling PZT Induced Acousto-ultrasonic Waves Propagating in Metallic & Composite Structures**
  Lonkar, K., Chang, F. -K
  2011
- **High Temperature Intelligent Composites**
  Li, Y. -H., Kim, S. -J., Salowitz, N., Roy, S., Larrosa, C., Janapati, V., Chang, F.
  2011
- **Damage classification in composite laminates, matrix micro-cracking and delamination**
  Larrosa, C., Lonkar, K., Shankar, S., Chang, F. -K
  2011
- **In-situ damage assessment of composite laminates via active sensor networks**
  Larrosa, C., Janapati, V., Roy, S., Chang, F. -K
  2011
- **Physics Based Temperature Compensation Strategy for Structural Health Monitoring** *8th International Workshop on Structural Health Monitoring*
  Roy, S., Lonkar, K., JANAPATI, V., Chang, F.
  DESTECH PUBLICATIONS, INC.2011: 1139–1149
- **A Robust Impact Force Determination Technique for Complex Structures**
  Mueller, I., Vonnieda, K., Das, S., Chang, F. -K
  2011
- **Accelerated aging experiments for prognostics of damage growth in composite materials**
  Saxena, A., Goebel, K., Larrosa, C., Janapati, V., Roy, S., Chang, F. -K
  2011
- **Development of a bio-inspired stretchable network for intelligent composites**
  Salowitz, N., Guo, Z., Li, Y. -H, Kim, K., Lanzara, G., Chen, Y., Chang, F.
  2011
- **On the Performance Quantification of Active Sensing SHM Systems using Model-assisted POD Methods**
  Mueller, I., Janapati, V., Banerjee, S., Lonkar, K., Roy, S., Chang, F. -K
  2011
- **Characterization of temperature, load and damage effects using piezo-electric transducer patches based on fuzzy clustering**
  Lopes, V., Gonsalez, C., da Silva, S., Roy, S., Kode, K., Sunor, F., Chang, F.
  2011
- **Development of SEM-based PESEA Code for Modeling PZT Induced Acousto-ultrasonic Waves Propagating in Metallic & Composite Structures**
  Lonkar, K., Chang, F. -K

2011

- **High Temperature Intelligent Composites**
  Li, Y. -H., Kim, S. -J., Salowitz, N., Roy, S., Larrosa, C., Janapati, V., Chang, F.
  2011
- **Damage classification in composite laminates, matrix micro-cracking and delamination**
  Larrosa, C., Lonkar, K., Shankar, S., Chang, F. -K
  2011
- **In-situ damage assessment of composite laminates via active sensor networks**
  Larrosa, C., Janapati, V., Roy, S., Chang, F. -K
  2011
- **A Spider-Web-Like Highly Expandable Sensor Network for Multifunctional Materials** *ADVANCED MATERIALS*
  Lanzara, G., Salowitz, N., Guo, Z., Chang, F.
  2010; 22 (41): 4643-4648
- **Editorial-2009 Technology Review and Update: Selected Highlights from IWSHM 2009** *STRUCTURAL HEALTH MONITORING-AN INTERNATIONAL JOURNAL*
  Chang, F., Guemes, A.
  2010; 9 (3): 197-198
- **Adhesive Layer Effects on PZT-induced Lamb Waves at Elevated Temperatures** *STRUCTURAL HEALTH MONITORING-AN INTERNATIONAL JOURNAL*
  Ha, S., Lonkar, K., Mittal, A., Chang, F.
  2010; 9 (3): 247-256
- **Prediction of Progressive Damage State at the Hot Spots using Statistical Estimation** *JOURNAL OF INTELLIGENT MATERIAL SYSTEMS AND STRUCTURES*
  Banerjee, S., Qing, X. P., Beard, S., Chang, F.
  2010; 21 (6): 595-605
- **Design of micro-scale highly expandable networks of polymer-based substrates for macro-scale applications** *SMART MATERIALS AND STRUCTURES*
  Lanzara, G., Feng, J., Chang, F.
  2010; 19 (4)
- **Adhesive interface layer effects in PZT-induced Lamb wave propagation** *SMART MATERIALS AND STRUCTURES*
  Ha, S., Chang, F.
  2010; 19 (2)
- **Sensor Network Optimization for a Passive Sensing Impact Detection Technique** *STRUCTURAL HEALTH MONITORING-AN INTERNATIONAL JOURNAL*
  Markmiller, J. F., Chang, F.
  2010; 9 (1): 25-39
- **Carbon Nanosensors for Health Monitoring of PZT Bondline During Curing and Its In-Service Life**
  Lanzara, G., Zhang, L., Chang, F.
  edited by Casciati, F., Giordano, M.
  DESTECH PUBLICATIONS, INC.2010: 1325-1331
- **Multifunctional Sensor Network for Structural State Sensing and Structural Health Monitoring**
  Qing, X. P., Ikegami, R., Beard, S. J., Zhang, D., Das, S., Banerjee, S., Chang, F.
  edited by Tomizuka, M., Yun, C. B., Giurgiutiu, Lynch, J. P.
  SPIE-INT SOC OPTICAL ENGINEERING.2010
- **The Needs for SHM Technology Classification**
  Mueller, I., Chang, F. -K
  2010

- **A Spider Web-Like Highly Expandable Sensor Network** *Advanced Materials*
  Lanzara, G., Salowitz, N., Guo, Z., Chang, F. -K
  2010; 41 (22): 44643-4648.
- **An Integrated Health Management System for Real-Time Impact Monitoring and Prediction of Impact-Induced Damage on Composite Structures**
  Mueller, I., Das, S., Roy, S., Janapati, V., Vonnieda, K., Zhang, D., Chang, F.
  2010
- **An Integrated Health Management System for Real-time Impact Monitoring and Prediction of Impact-Induced Damage on Composite Structures** *Conference on Health Monitoring of Structural and Biological Systems 2010*
  Mueller, I., Das, S., Roy, S., Janapati, V., Vonnieda, K., Zhang, D., Chang, F.
  SPIE-INT SOC OPTICAL ENGINEERING.2010
- **Optimizing a spectral element for modeling PZT-induced Lamb wave propagation in thin plates** *SMART MATERIALS & STRUCTURES*
  Ha, S., Chang, F.
  2010; 19 (1)
- **Design and characterization of a carbon-nanotube-reinforced adhesive coating for piezoelectric ceramic discs** *SMART MATERIALS & STRUCTURES*
  Lanzara, G., Chang, F.
  2009; 18 (12)
- **Development of a real-time active pipeline integrity detection system** *SMART MATERIALS & STRUCTURES*
  Qing, X. P., Beard, S., Shen, S. B., Banerjee, S., Bradley, I., Salama, M. M., Chang, F.
  2009; 18 (11)
- **Influence of Interface Degradation on the Performance of Piezoelectric Actuators** *JOURNAL OF INTELLIGENT MATERIAL SYSTEMS AND STRUCTURES*
  Lanzara, G., Yoon, Y., Kim, Y., Chang, F.
  2009; 20 (14): 1699-1710
- **Monitoring Impact Events Using a System-Identification Method** *AIAA JOURNAL*
  Park, J., Ha, S., Chang, F.
  2009; 47 (9): 2011-2021
- **Optimal placement of sensors for sub-surface fatigue crack monitoring** *THEORETICAL AND APPLIED FRACTURE MECHANICS*
  Teo, Y. H., Chiu, W. K., Chang, F. K., Rajic, N.
  2009; 52 (1): 40-49
- **Damage Detection for Composite Laminate Plates with A Distributed Hybrid PZT/FBG Sensor Network** *JOURNAL OF INTELLIGENT MATERIAL SYSTEMS AND STRUCTURES*
  Wu, Z., Qing, X. P., Chang, F.
  2009; 20 (9): 1069-1077
- **A new type of plasma wakefield accelerator driven by magnetowaves** *PLASMA PHYSICS AND CONTROLLED FUSION*
  Chen, P., Chang, F., Lin, G., Noble, R. J., Sydora, R.
  2009; 51 (2)
- **The effects of structural variations on the health monitoring of composite structures** *International Workshop on Structural Assessment of Composite Structures*
  Chiu, W. K., Tian, T., Chang, F. K.
  ELSEVIER SCI LTD.2009: 121–40
- **An integrated health management and prognostic technology for composites airframe structures**
  Mueller, I., Larrosa, C., Roy, S., Mittal, A., Lonkar, K., Chang, F. -K
  2009
- **A robust structural health monitoring technique for airframe structures**
  Mueller, I., Chang, F. -K, Roy, S., Mittal, A., Lonkar, K., Larrosa, C.

2009

- **An integrated diagnostic to prognostic SHM technology for structural health management**
  Mueller, I., Larrosa, C., Roy, S., Chang, F. -K
  2009
- **Model-Based Impact Monitoring by Inverse Methods using Particle Swarm Optimization**
  Mueller, I., Chang, F. -K
  2009
- **Adhesive Layer Effects on Temperature-sensitive Lamb Waves Induced by Surface-mounted PZT Acutators**
  Ha, S., Mittal, A., Lonkar, K., Chang, F. -K
  2009
- **SACL Activities in Structural Health Monitoring**
  Guo, Z., Mueller, I., Lanzara, G., Janapala, N., Lonkar, K., Mittal, A., Chang, F.
  2009
- **Design of Planar Electrodes for Multifunctional Piezoelectric Sensors**
  Salowitz, N., Lanzara, G., Guo, Z., Rose, J., Chang, F. -K
  2009
- **Multifunctional Sensor Nodes in Stretchable Network for Structural Health Monitoring**
  Lanzara, G., Salowitz, N., Guo, Z., Chatterjee, D., Kim, K., Peumans, P., Chang, F.
  2009
- **Health monitoring of bonded composite repair in bridge rehabilitation** *SMART MATERIALS AND STRUCTURES*
  Wu, Z., Qing, X. P., Ghosh, K., Karbhar, V., Chang, F.
  2008; 17 (4)
- **In vitro atherosclerotic plaque characterization by acoustic impedance monitoring, Part I: Sensor modeling, design, and fabrication** *JOURNAL OF INTELLIGENT MATERIAL SYSTEMS AND STRUCTURES*
  Dugnani, R., Chang, F. K.
  2008; 19 (7): 815-826
- **In vitro atherosclerotic plaque characterization by acoustic impedance monitoring, Part II: Experimentation and validation** *JOURNAL OF INTELLIGENT MATERIAL SYSTEMS AND STRUCTURES*
  Dugnani, R., Chang, F. K.
  2008; 19 (7): 827-835
- **Time-domain spectral element method for built-in piezoelectric-actuator-induced lamb wave propagation analysis** *AIAA JOURNAL*
  Kim, Y., Ha, S., Chang, F.
  2008; 46 (3): 591-600
- **Pitch-catch active sensing methods in structural health monitoring for aircraft structures** *STRUCTURAL HEALTH MONITORING-AN INTERNATIONAL JOURNAL*
  Ihn, J., Chang, F.
  2008; 7 (1): 5-19
- **A large area flexible expandable network for structural health monitoring** *Conference on Sensors and Smart Structures Technologies for Civil, Mechanical, and Aerospace Systems*
  Lanzara, G., Feng, J., Chang, F.
  SPIE-INT SOC OPTICAL ENGINEERING.2008
- **Design and experimental validation of a structural health monitoring fastener** *ASME International Mechanical Engineering Congress and Exposition*
  Rakow, A., Chang, F.
  AMER SOC MECHANICAL ENGINEERS.2008: 707–713
- **A potential link from damage diagnostics to health prognostics of composites through built-in sensors** *JOURNAL OF VIBRATION AND ACOUSTICS-TRANSACTIONS OF THE ASME*

Chang, F., Markmiller, J. F., Ihn, J., Cheng, K. Y.
2007; 129 (6): 718-729

- **Energy absorption features of 3-D braided rectangular composite under different strain rates compressive loading** *AEROSPACE SCIENCE AND TECHNOLOGY*
  Gu, B., Chang, F.
  2007; 11 (7-8): 535-545
- **Built-in sensor network for structural health monitoring of composite structure** *JOURNAL OF INTELLIGENT MATERIAL SYSTEMS AND STRUCTURES*
  Qing, X. P., Beard, S. J., Kumar, A., Ooi, T. K., Chang, F.
  2007; 18 (1): 39-49
- **Novel processes to reinforce the piezoelectric actuator interface with carbon nanotubes**
  Lanzara, G., Chang, F. K.
  edited by Dapino, M. J.
  SPIE-INT SOC OPTICAL ENGINEERING.2007
- **Design of a robust SHM system for composite structures**
  Beard, S., Liu, C., Chang, F.
  edited by Davis, L. P., Henderson, B. K., McMickell, M. B.
  SPIE-INT SOC OPTICAL ENGINEERING.2007
- **An in-situ sensor design for monitoring fatigue damage in bolted joints**
  Rakow, A., Chang, F.
  edited by Chang, F. K.
  DESTECH PUBLICATIONS, INC.2007: 109-120
- **A new SMART sensing system for aerospace structures** *UNMANNED SYSTEMS TECHNOLOGY IX*
  Zhang, D. C., Yu, P., Beard, S., Qing, P., Kumar, A., Chang, F.
  2007; 6561
- **Optimal estimation of accumulating damage trend from a series of SHM images** *6th International Workshop on Structural Health Monitoring*
  Gorinevsky, D., Kim, S., Boyd, S., Gordon, G., Beard, S., Chang, F.
  DESTECH PUBLICATIONS, INC.2007: 1340–1346
- **Stretching of a monolithic silicon-based sensor network for large area embedded Structural Health Monitoring** *6th International Workshop on Structural Health Monitoring*
  Lanzara, G., Feng, J., Huang, K., Dinyari, R., Kim, J. Y., Peumans, P., Chang, F.
  DESTECH PUBLICATIONS, INC.2007: 778–785
- **An approach to cost-effective, robust, large-area electronics using monolithic silicon** *IEEE International Electron Devices Meeting*
  Huang, K., Dinyari, R., Lanzara, G., Kim, J. Y., Feng, J., Vancura, C., Chang, F., Peumans, P.
  IEEE.2007: 217–220
- **Detection of bolt loosening in C-C composite thermal protection panels: I. Diagnostic principle** *SMART MATERIALS AND STRUCTURES*
  Yang, J. Y., Chang, F. K.
  2006; 15 (2): 581-590
- **Detection of bolt loosening in C-C composite thermal protection panels: II. Experimental verification** *SMART MATERIALS AND STRUCTURES*
  Yang, J. K., Chang, F. K.
  2006; 15 (2): 591-599
- **Debond detection using embedded piezoelectric elements in reinforced concrete structures - Part I: Experiment** *STRUCTURAL HEALTH MONITORING-AN INTERNATIONAL JOURNAL*
  Wu, F., Chang, F. K.
  2006; 5 (1): 5-15
- **Debond detection using embedded piezoelectric elements for reinforced concrete structures - Part II: Analysis and algorithm** *STRUCTURAL HEALTH MONITORING-AN INTERNATIONAL JOURNAL*

Wu, F., Chang, F. K.
2006; 5 (1): 17-28

- **Structural health monitoring of composite repair patches in bridge rehabilitation** *Smart Structures and Materials 2006 Conference*
  Wu, Z., Ghosh, K., Qing, X., Karbhari, V., Chang, F.
  SPIE-INT SOC OPTICAL ENGINEERING.2006
- **A new look in design of intelligent structures with SHM**
  Chang, F., Markmiller, J. C.
  edited by Guemes, A.
  DESTECH PUBLICATIONS, INC.2006: 5-+
- **Monitoring the disbond of externally bonded CFRP composite strips for rehabilitation of bridges**
  Qing, X. P., Wu, Z., Chang, F., Ghosh, K., Karbhari, V., Sikorsky, C.
  edited by Guemes, A.
  DESTECH PUBLICATIONS, INC.2006: 463-+
- **Towards a dynamic data driven system for structural and material health monitoring** *6th International Conference on Computational Science (ICCS 2006)*
  Farhat, C., Michopoulos, J. G., Chang, F. K., Guibas, L. J., Lew, A. J.
  SPRINGER-VERLAG BERLIN.2006: 456–464
- **A hybrid piezoelectric/fiber optic diagnostic system for structural health monitoring** *1st International Conference on Structural Health Monitoring and Intelligent Infrastructure*
  Qing, X. L., Kumar, A., Zhang, C., Gonzalez, I. F., Guo, G. P., Chang, F. K.
  IOP PUBLISHING LTD.2005: S98–S103
- **Scattering of plate waves by a cylindrical inhomogeneity** *JOURNAL OF SOUND AND VIBRATION*
  Wang, C. H., Chang, F. K.
  2005; 282 (1-2): 429-451
- **Design of Active Structural Health Monitoring Systems for Aircraft and Spacecraft Structures** *DAMAGE PROGNOSIS: FOR AEROSPACE, CIVIL AND MECHANICAL SYSTEMS*
  Chang, F., Ihn, J., Blaise, E.
  edited by Inman, D. J., Farrar, C. R., Lopes, Steffen
  2005: 323-341
- **Detection and monitoring of hidden fatigue crack growth using a built-in piezoelectric sensor/actuator network: I. Diagnostics** *SMART MATERIALS & STRUCTURES*
  Ihn, J. B., Chang, F. K.
  2004; 13 (3): 609-620
- **Detection and monitoring of hidden fatigue crack growth using a built-in piezoelectric sensor/actuator network: II. Validation using riveted joints and repair patches** *SMART MATERIALS & STRUCTURES*
  Ihn, J. B., Chang, F. K.
  2004; 13 (3): 621-630
- **A synthetic time-reversal imaging method for structural health monitoring** *SMART MATERIALS & STRUCTURES*
  Wang, C. H., Rose, J. T., Chang, F. K.
  2004; 13 (2): 415-423
- **Ferroelectric and piezoelectric properties of disk shape lead zirconate titanate thick films** *MATERIALS TRANSACTIONS*
  Iijima, T., Ito, S., Matsuda, H., Dugnani, R., Chang, F. K.
  2004; 45 (2): 233-235
- **Damage tolerance of notched composite laminates with reinforcing strips** *JOURNAL OF COMPOSITE MATERIALS*
  Qing, X. L., Chang, F. K., Starnes, J.
  2003; 37 (2): 111-128
- **Vibration analysis of delaminated composite beams and plates using a higher-order finite element** *INTERNATIONAL JOURNAL OF MECHANICAL SCIENCES*

Hu, N., Fukunaga, H., Kameyama, M., Aramaki, Y., Chang, F. K.
2002; 44 (7): 1479-1503

- **Magneto-rheological fluid dampers for control of bridges** *ASME International Mechanical Engineering Congress and Exposition*
Gordaninejad, F., Saiidi, M., Hansen, B. C., Ericksen, E. O., Chang, F. K.
SAGE PUBLICATIONS LTD.2002: 167–80

- **Energy absorption of braided composite tubes** *INTERNATIONAL JOURNAL OF CRASHWORTHINESS*
Beard, S. J., Chang, F. K.
2002; 7 (2): 191-206

- **Design of braided composites for energy absorption** *JOURNAL OF THERMOPLASTIC COMPOSITE MATERIALS*
Beard, S., Chang, F. K.
2002; 15 (1): 3-12

- **Structural damage identification using piezoelectric sensors** *INTERNATIONAL JOURNAL OF SOLIDS AND STRUCTURES*
Fukunaga, H., Hu, N., Chang, F. K.
2002; 39 (2): 393-418

- **The manufacture of composite structures with a built-in network of piezoceramics** *COMPOSITES SCIENCE AND TECHNOLOGY*
Lin, M., Chang, F. K.
2002; 62 (7-8): 919-939

- **The response of composite joints with bolt-clamping loads, Part II: Model verification** *JOURNAL OF COMPOSITE MATERIALS*
Sun, H. T., Chang, F. K., Qing, X. L.
2002; 36 (1): 69-92

- **The response of composite joints with bolt-clamping loads, Part 1: Model development** *JOURNAL OF COMPOSITE MATERIALS*
Sun, H. T., Chang, F. K., Qing, X. L.
2002; 36 (1): 47-67

- **Structural health monitoring from fiber-reinforced composites to steel-reinforced concrete** *European COST F3 Conference on System Identification and Structural Health Monitoring*
Wang, C. S., Wu, F., Chang, F. K.
IOP PUBLISHING LTD.2001: 548–52

- **Special issue on structural health monitoring - Preface** *SMART MATERIALS & STRUCTURES*
Guemes, A., Boller, C., Chang, F. K.
2001; 10 (3): U3-U3

- **Impact identification of stiffened composite panels: II. Implementation studies** *SMART MATERIALS & STRUCTURES*
Seydel, R., Chang, F. K.
2001; 10 (2): 370-379

- **Impact identification of stiffened composite panels: I. System development** *SMART MATERIALS & STRUCTURES*
Seydel, R., Chang, F. K.
2001; 10 (2): 354-369

- **Characterization of matrix crack-induced laminate failure - Part II: Analysis and verifications** *JOURNAL OF COMPOSITE MATERIALS*
Johnson, P., Chang, F. K.
2001; 35 (22): 2037-2074

- **Characterization of matrix crack-induced laminate failure - Part I: Experiments** *JOURNAL OF COMPOSITE MATERIALS*
Johnson, P., Chang, F. K.
2001; 35 (22): 2009-2035

- **Modelling of splitting and delamination in notched cross-ply laminates** *COMPOSITES SCIENCE AND TECHNOLOGY*
Wisnom, M. R., Chang, F. K.
2000; 60 (15): 2849-2856

- **Experimental study on clamping effects on the tensile strength of composite plates with a bolt-filled hole** *COMPOSITES PART A-APPLIED SCIENCE AND MANUFACTURING*
  Yan, Y., Wen, W. D., Chang, F. K., Shyprykevich, P.
  1999; 30 (10): 1215-1229
- **Identifying impacts in composite plates with piezoelectric strain sensors, Part I: Theory** *JOURNAL OF INTELLIGENT MATERIAL SYSTEMS AND STRUCTURES*
  Tracy, M., Chang, F. K.
  1998; 9 (11): 920-928
- **Identifying impacts in composite plates with piezoelectric strain sensors, Part II: Experiment** *JOURNAL OF INTELLIGENT MATERIAL SYSTEMS AND STRUCTURES*
  Tracy, M., Chang, F. K.
  1998; 9 (11): 929-937
- **Structural health monitoring** *JOURNAL OF INTELLIGENT MATERIAL SYSTEMS AND STRUCTURES*
  Pines, D. J., Chang, F. K.
  1998; 9 (11): 875-875
- **Composite hip prosthesis design .1. Analysis** *JOURNAL OF BIOMEDICAL MATERIALS RESEARCH*
  Yildiz, H., Ha, S. K., Chang, F. K.
  1998; 39 (1): 92-101
- **Composite hip prosthesis design .2. Simulation** *JOURNAL OF BIOMEDICAL MATERIALS RESEARCH*
  Yildiz, H., Chang, F. K., Goodman, S.
  1998; 39 (1): 102-119
- **Active damage detection in filament wound composite tubes using built-in sensors and actuators** *JOURNAL OF INTELLIGENT MATERIAL SYSTEMS AND STRUCTURES*
  Beard, S., Chang, F. K.
  1997; 8 (10): 891-897
- **Identification of impact force and location using distributed sensors** *AIAA JOURNAL*
  Choi, K. Y., Chang, F. K.
  1996; 34 (1): 136-142
- **Bearing failure of bolted composite joints .1. Experimental characterization** *JOURNAL OF COMPOSITE MATERIALS*
  Wang, H. S., Hung, C. L., Chang, F. K.
  1996; 30 (12): 1284-1313
- **Strength envelope of bolted composite joints under bypass loads** *JOURNAL OF COMPOSITE MATERIALS*
  Hung, C. L., Chang, F. K.
  1996; 30 (13): 1402-1435
- **Bearing failure of bolted composite joints .2. Model and verification** *JOURNAL OF COMPOSITE MATERIALS*
  Hung, C. L., Chang, F. K.
  1996; 30 (12): 1359-1400
- **IDENTIFYING DELAMINATION IN COMPOSITE BEAMS USING BUILT-IN PIEZOELECTRICS .1. EXPERIMENTS AND ANALYSIS** *JOURNAL OF INTELLIGENT MATERIAL SYSTEMS AND STRUCTURES*
  Keilers, C. H., Chang, F. K.
  1995; 6 (5): 649-663
- **IDENTIFYING DELAMINATION IN COMPOSITE BEAMS USING BUILT-IN PIEZOELECTRICS .2. AN IDENTIFICATION METHOD** *JOURNAL OF INTELLIGENT MATERIAL SYSTEMS AND STRUCTURES*
  Keilers, C. H., Chang, F. K.
  1995; 6 (5): 664-672
- **AN ACCUMULATIVE DAMAGE MODEL FOR TENSILE AND SHEAR FAILURES OF LAMINATED COMPOSITE PLATES** *JOURNAL OF COMPOSITE MATERIALS*
  Shahid, I., Chang, F. K.

1995; 29 (7): 926-981

- **COMPOSITE PANELS CONTAINING MULTIPLE THROUGH-THE-WIDTH DELAMINATIONS AND SUBJECTED TO COMPRESSION .1. ANALYSIS** *COMPOSITE STRUCTURES*
  KUTLU, Z., Chang, F. K.
  1995; 31 (4): 273-296
- **COMPOSITE PANELS CONTAINING MULTIPLE THROUGH-THE-WIDTH DELAMINATIONS AND SUBJECTED TO COMPRESSION .2. EXPERIMENTS AND VERIFICATION** *COMPOSITE STRUCTURES*
  KUTLU, Z., Chang, F. K.
  1995; 31 (4): 297-314
- **PREDICTING SCALING EFFECT ON THE NOTCHED STRENGTH OF PREPREG AND FIBER TOW-PLACED LAMINATED COMPOSITES** *JOURNAL OF COMPOSITE MATERIALS*
  Shahid, I., Sun, H. T., Chang, F. K.
  1995; 29 (8): 1063-1095
- **MATRIX CRACKING EFFECT ON DELAMINATION GROWTH IN COMPOSITE LAMINATES INDUCED BY A SPHERICAL INDENTER** *JOURNAL OF COMPOSITE MATERIALS*
  Liu, S., Chang, F. K.
  1994; 28 (10): 940-977
- **MATRIX CRACKING AND DELAMINATION IN LAMINATED COMPOSITE BEAMS SUBJECTED TO A TRANSVERSE CONCENTRATED LINE LOAD** *JOURNAL OF COMPOSITE MATERIALS*
  Sheng, L., KUTLU, Z., Chang, F. K.
  1993; 27 (5): 436-470
- **FINITE-ELEMENT ANALYSIS OF COMPOSITE STRUCTURES CONTAINING DISTRIBUTED PIEZOCERAMIC SENSORS AND ACTUATORS** *AIAA JOURNAL*
  Ha, S. K., KEILERS, C., Chang, F. K.
  1992; 30 (3): 772-780
- **MODELING COMPRESSION FAILURE OF LAMINATED COMPOSITES CONTAINING MULTIPLE THROUGH-THE-WIDTH DELAMINATIONS** *JOURNAL OF COMPOSITE MATERIALS*
  KUTLU, Z., Chang, F. K.
  1992; 26 (3): 350-387
- **EFFECT OF LAMINATE CONFIGURATION AND IMPACTORS MASS ON THE INITIAL IMPACT DAMAGE OF GRAPHITE EPOXY COMPOSITE PLATES DUE TO LINE-LOADING IMPACT** *JOURNAL OF COMPOSITE MATERIALS*
  Choi, H. Y., Wang, H. S., Chang, F. K.
  1992; 26 (6): 804-827
- **A MODEL FOR PREDICTING DAMAGE IN GRAPHITE EPOXY LAMINATED COMPOSITES RESULTING FROM LOW-VELOCITY POINT IMPACT** *JOURNAL OF COMPOSITE MATERIALS*
  Choi, H. Y., Chang, F. K.
  1992; 26 (14): 2134-2169
- **IMPACT DAMAGE RESISTANCE OF GRAPHITE EPOXY LAMINATED COMPOSITES** *POLYMER COMPOSITES - 90 CONF*
  Choi, H. Y., Chang, F. K.
  SOC PLASTICS ENG INC.1991: 1294–1300
- **A NEW APPROACH TOWARD UNDERSTANDING DAMAGE MECHANISMS AND MECHANICS OF LAMINATED COMPOSITES DUE TO LOW-VELOCITY IMPACT .2. ANALYSIS** *JOURNAL OF COMPOSITE MATERIALS*
  Choi, H. Y., WU, H. Y., Chang, F. K.
  1991; 25 (8): 1012-1038
- **A NEW APPROACH TOWARD UNDERSTANDING DAMAGE MECHANISMS AND MECHANICS OF LAMINATED COMPOSITES DUE TO LOW-VELOCITY IMPACT .1. EXPERIMENTS** *JOURNAL OF COMPOSITE MATERIALS*
  Choi, H. Y., DOWNS, R. J., Chang, F. K.
  1991; 25 (8): 992-1011

- **MODELING THE VISCOPLASTIC BEHAVIOR OF FIBER-REINFORCED THERMOPLASTIC MATRIX COMPOSITES AT ELEVATED-TEMPERATURES** *JOURNAL OF COMPOSITE MATERIALS*
  Ha, S. K., Wang, Q. L., Chang, F. K.
  1991; 25 (4): 334-374
- **DAMAGE TOLERANCE OF LAMINATED COMPOSITES CONTAINING AN OPEN HOLE AND SUBJECTED TO TENSILE LOADINGS** *JOURNAL OF COMPOSITE MATERIALS*
  Chang, K. Y., Liu, S., Chang, F. K.
  1991; 25 (3): 274-301
- **EFFECT OF LOAD DISTRIBUTION ON THE FIBER BUCKLING STRENGTH OF UNIDIRECTIONAL COMPOSITES** *JOURNAL OF COMPOSITE MATERIALS*
  Lessard, L. B., Chang, F. K.
  1991; 25 (1): 65-87
- **DAMAGE TOLERANCE OF LAMINATED COMPOSITES CONTAINING AN OPEN HOLE AND SUBJECTED TO COMPRESSIVE LOADINGS .2. EXPERIMENT** *JOURNAL OF COMPOSITE MATERIALS*
  Lessard, L. B., Chang, F. K.
  1991; 25 (1): 44-64
- **DAMAGE TOLERANCE OF LAMINATED COMPOSITES CONTAINING AN OPEN HOLE AND SUBJECTED TO COMPRESSIVE LOADINGS .1. ANALYSIS** *JOURNAL OF COMPOSITE MATERIALS*
  Chang, F. K., Lessard, L. B.
  1991; 25 (1): 2-43
- **STUDY ON IMPACT DAMAGE IN LAMINATED COMPOSITES** *1989 ARMY SYMP ON SOLID MECHANICS : MECHANICS OF ENGINEERED MATERIALS AND APPLICATIONS*
  Chang, F. K., Choi, H. Y., Jeng, S. T.
  ELSEVIER SCIENCE BV.1990: 83–95
- **ANALYSIS OF THICK LAMINATED COMPOSITES** *JOURNAL OF COMPOSITE MATERIALS*
  Chang, F. K., Perez, J. L., Chang, K. Y.
  1990; 24 (8): 801-822
- **STIFFNESS AND STRENGTH TAILORING OF A HIP-PROSTHESIS MADE OF ADVANCED COMPOSITE-MATERIALS** *JOURNAL OF BIOMEDICAL MATERIALS RESEARCH*
  Chang, F. K., Perez, J. L., Davidson, J. A.
  1990; 24 (7): 873-899
- **DELAMINATION EFFECTS ON COMPOSITE SHELLS** *JOURNAL OF ENGINEERING MATERIALS AND TECHNOLOGY-TRANSACTIONS OF THE ASME*
  Chang, F. K., KUTLU, Z.
  1990; 112 (3): 336-340
- **CHARACTERIZATION OF IMPACT DAMAGE IN LAMINATED COMPOSITES** *SAMPE JOURNAL*
  Chang, F. K., Choi, H. Y., Jeng, S. T.
  1990; 26 (1): 18-25
- **STUDY ON THE CRUSHING RESPONSE OF CYLINDRICAL COMPOSITE SHELLS SUBJECTED TO TRANSVERSE LOADING** *JOURNAL OF COMPOSITES TECHNOLOGY & RESEARCH*
  Chang, F. K., KUTLU, Z.
  1990; 12 (4): 239-244
- **PREDICTING MODULI AND STRENGTHS REDUCTION OF UNIDIRECTIONAL GRAPHITE EPOXY COMPOSITES DUE TO HYGROTHERMAL EFFECTS** *JOURNAL OF REINFORCED PLASTICS AND COMPOSITES*
  Chang, F. K., Shahid, I., ENGDAHL, R. A.
  1989; 8 (2): 106-132
- **STRENGTH AND RESPONSE OF CYLINDRICAL COMPOSITE SHELLS SUBJECTED TO OUT-OF-PLANE LOADINGS** *JOURNAL OF COMPOSITE MATERIALS*
  Chang, F. K., KUTLU, Z.

1989; 23 (1): 11-31

- **TRANSIENT DYNAMIC ANALYSIS OF LAMINATED COMPOSITE PLATES SUBJECTED TO TRANSVERSE IMPACT** *COMPUTERS & STRUCTURES*
  WU, H. Y., Chang, F. K.
  1989; 31 (3): 453-466
- **MODELING OF UNIDIRECTIONAL PREFORMED COMPOSITES** *JOURNAL OF REINFORCED PLASTICS AND COMPOSITES*
  Chang, F. K., Chang, K. Y., Engdahl, R.
  1988; 7 (6): 582-600
- **COMPRESSION RESPONSE OF LAMINATED COMPOSITES CONTAINING AN OPEN HOLE** *SAMPE QUARTERLY-SOCIETY FOR THE ADVANCEMENT OF MATERIAL AND PROCESS ENGINEERING*
  Chang, F. K., Lessard, L., Tang, J. M.
  1988; 19 (4): 46-51
- **THE EFFECT OF TESTING METHODS ON THE SHEAR-STRENGTH DISTRIBUTION IN LAMINATED COMPOSITES** *JOURNAL OF REINFORCED PLASTICS AND COMPOSITES*
  Chang, F. K., Tang, J. M., Peterson, D. G.
  1987; 6 (4): 304-318
- **A PROGRESSIVE DAMAGE MODEL FOR LAMINATED COMPOSITES CONTAINING STRESS-CONCENTRATIONS** *JOURNAL OF COMPOSITE MATERIALS*
  Chang, F. K., Chang, K. Y.
  1987; 21 (9): 834-855
- **POST-FAILURE ANALYSIS OF BOLTED COMPOSITE JOINTS IN TENSION OR SHEAR-OUT MODE FAILURE** *JOURNAL OF COMPOSITE MATERIALS*
  Chang, F. K., Chang, K. Y.
  1987; 21 (9): 809-833
- **THE INSITU PLY SHEARSTRENGTH DISTRIBUTIONS IN GRAPHITE - EPOXY LAMINATED COMPOSITES** *JOURNAL OF COMPOSITE MATERIALS*
  Chang, F. K., Chen, M. H.
  1987; 21 (8): 708-733
- **THE STRENGTHS OF FIBER REINFORCED COMPOSITE BENDS** *JOURNAL OF COMPOSITE MATERIALS*
  Chang, F. K., Springer, G. S.
  1986; 20 (1): 30-45
- **EFFECTS OF PARTIAL CLOSURE AND FRICTION ON A RADIAL CRACK EMANATING FROM A CIRCULAR HOLE** *INTERNATIONAL JOURNAL OF FRACTURE*
  COMNINOU, M., Chang, F. K.
  1985; 28 (1): 29-36
- **DESIGN OF COMPOSITE LAMINATES CONTAINING PIN LOADED HOLES** *JOURNAL OF COMPOSITE MATERIALS*
  Chang, F. K., Scott, R. A., Springer, G. S.
  1984; 18 (3): 279-289
- **FAILURE STRENGTH OF NONLINEARLY ELASTIC COMPOSITE LAMINATES CONTAINING A PIN LOADED HOLE** *JOURNAL OF COMPOSITE MATERIALS*
  Chang, F. K., Scott, R. A., Springer, G. S.
  1984; 18 (5): 464-477
- **THE EFFECT OF LAMINATE CONFIGURATION ON CHARACTERISTIC LENGTHS AND RAIL SHEAR-STRENGTH** *JOURNAL OF COMPOSITE MATERIALS*
  Chang, F. K., Scott, R. A., Springer, G. S.
  1984; 18 (3): 290-296
- **FAILURE OF COMPOSITE LAMINATES CONTAINING PIN LOADED HOLES - METHOD OF SOLUTION** *JOURNAL OF COMPOSITE MATERIALS*
  Chang, F. K., Scott, R. A., Springer, G. S.

1984; 18 (3): 255-278