

Stanford



Fu-Kuo Chang

Professor of Aeronautics and Astronautics

CONTACT INFORMATION

- **Administrator**

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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)
- Best Paper Award, 7th International National Workshop on Structural Health Monitoring (2009)
- Best Paper Award, 3rd European Workshop on Structural Health Monitoring (2006)
- Structural Health Monitoring (SHM) Lifetime Achievement Award, The Boeing Company (2004)
- Presidential Young Investigator Award, National Science Foundation (1988)

BOARDS, ADVISORY COMMITTEES, PROFESSIONAL ORGANIZATIONS

- Editor-in-Chief, Int. J. of Structural Health Monitoring (2012 - present)
- Fellow, American Institute of Aeronautics and Astronautics (2013 - present)
- Fellow, American Society of Mechanical Engineers (2013 - present)

PROFESSIONAL EDUCATION

- PhD, Michigan (1983)

LINKS

- Structures and Composites (SACL) laboratory: <https://sacl8.sites.stanford.edu/>

Teaching

COURSES

2023-24

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

2022-23

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

2021-22

- Introduction to Mechanics of Composite Materials: AA 156 (Aut)
- Mechanics of Composites: AA 256 (Win)

2020-21

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

STANFORD ADVISEES

Postdoctoral Faculty Sponsor

Shabbir Ahmed, Saman Farhangdoust

Doctoral Dissertation Advisor (AC)

Tanay Topac

Master's Program Advisor

Giovanna Angelo, Jason Gunn, Bryan Tiang

Publications

PUBLICATIONS

- 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
- **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)
- **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
- **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)
- **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
- **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
- **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
- **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
- **Micro-Fabricated, Expandable Temperature Sensor Network for Macro-Scale Deployment in Composite Structures**
Guo, Z., Kim, K., Lanzara, G., Salowitz, N., Peumans, P., 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., Gonzalez, 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

- **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
 - **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
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