

ASC 23rd Technical Conference Preliminary Program

ADT: Analysis & Testing

Tuesday 9:15 AM 12:15 PM

- 135 Numerical Study of the Foreign-object Impact on the Composite Fan Blade
M. Nishikawa K. Hemmi N. Takeda
- 46 Mathematical Homogenization Based Multiscale Modeling of Composite Structures
C. Oskay
- 45 Stress Concentrations Around Cut-outs in Anisotropic Plates: A Short Assessment of Lekhnitskii's Formalism
M. J. van Enkhuizen S. Koussios A. Beukers
- 77 CMU Infill Wall Blast Simulation for Optimizing Performance of Nano-Particle Enhancement of Energy Absorption and Debris Mitigation
M. Irshidat A. Al-Ostaz C. Mullen A.H.-D. Cheng P. R. Mantena
- 3 Tunable Vibration Characteristics of Grid Stiffened Composite Structure with Various Fillers
J. Cheng G. Li S.-S. Pang
- 134 Inter Facial Degradation on SMC in Hot Water and Pressure Conditions
T. Koyanagi T. Akatsu Y. Fujii H. Hamada

ADT: Laminate Mechanics

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- 24 Transverse Load Introduction in Thick Composites
W. Wilson C. Creemers P. Nijhuis M. Smeets P. Vergouwen
- 6 Behavior of Quasi-three-dimensional Woven Composites
D. Liu S. Klann K. Rosario
- 154 Analysis of Laminated Composites Tapered Tubes
C. Rao W. S. Chan
- 67 Modeling and Characterization of Flexible Composite Airship Envelope Laminates
D. S. Dancila
- 65 A Correlation Model for Graphite/Epoxy Properties for Propagating Uncertainty to Strain Response
B. P. Smarslok R. T. Haftka P. Ifju
- 72 Hygrothermally Stable Laminates with Optimum Extension-Twist Coupling
R. Haynes R. Cross E. Armanios

ADT: Damage & Failure

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- 43 Finite Element Analysis of the Inelastic Behavior of Random Fiber Composites
Y. Pan L. Iorga A. A. Pelegri
- 113 Validation of Finite Element Analysis for Strength Prediction of High Pressure Wet Wound Composite Vessels
V. Schultheis A. Bleier H. Schurmann S. Fell
- 70 Modeling Failure of a Bonded Interface Using Cohesive Zone Model
A. A. Brown Y. Ohashi W.-Y. Lu J. Foulk III T. Bennett S. Margolis
- 109 Modeling of Failure from Processing Induced Defects in Polymer Matrix Composites
R. Talreja C. V. Singh
- 153 Carbon Nanotube Networks as a Strain Indicator and Failure Predictor in Polymer Matrix Composites Subjecting to Static and Dynamic Loads
M. Nofar S. V. Hoa M. D. Pugh
- 49 Comparison of Creep Response and Damage Accumulation Between Short and Long Glass Fibre Mat Thermoplastic Composites
P. Dasappa J. Mui P. Lee-Sullivan X. Xiao P. H. Foss

ET: Natural Fibers & Resins

Tuesday 9:15 AM 12:15 PM

- 142 Fabrication and Mechanical Properties of Continuous Natural Fiber Reinforced Biodegradable Braided Composite
N. Shikamoto P. Wongsriraska A. Ohtani L. Y. Wei A. Nakai
- 62 Lamination Process for Natural Fiber/Polymer Composites
S. Q. Shi S. Lee J. Shi
- 119 Novel Natural Fiber/Recycled Polyethylene Composites: Processing, Surface Treatment, and Characterization
D. Cho K. Y. Lee D. S. Bang H. Kye
- 140 Deformation Behavior of Bamboo Bow with Hybrid Structure
K. Shibata Y. Hidekuma A. Nakai H. Hamada
- 121 Synthesis and Characterization of Modified Soybean Oil and Methacrylated Fatty Acid Derived Resins for Sheet Molding Compounds
T. Nelson J. LaScala M. V. Hosur S. Jeelani

ET: Nanocomposites Fabrication

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- 53 Fabrication and Characterization of a Thermotropic Liquid Crystalline Polymer Reinforced with Single Walled Carbon Nanotubes
A. Rohatgi J. P. Thomas
- 93 Fabrication and Characterization of Magnetic Nanoparticles Reinforced Polyacrylonitrile Nanocomposite
Z. Guo R. Chung H. T. Hahn
- 4 Interphase of a Nanoreinforced Laminated Composite Material
J. L. Abot Y. Song
- 95 Resole Phenolic / Layered Silicate Nanocomposites: A Comparison of Two Synthesis Techniques
M. E. Rogers M. V. Hosur A. Ludwick S. Jeelani
- 66 Multi-Functional Reactive Graphitic Nanofibers (r-GNFs)-epoxy Resin as Matrix for Composites
S. Jana W.-H. K. Zhong
- 85 Nanostructure/strain-resistance in Nanolaminates Containing Carbon Nanofibers and Carbon Nanotubes
M. Merrill C. T. Sun

Reddy Symposium I

Tuesday 9:15 AM 12:15 PM

- 26 Adaptive Multiscale Modeling of Progressive Failure in Composite Laminates
D. Robbins
- 8 Multi-scale Modeling of Thermo-oxidative Degradation of High Temperature Polymer Matrix Composites
S. Roy S. Singh
- 50 Non-cylindrical Composite Pressurized Fuselages for Future Aircraft
F. J. J. M. M. Geuskens S. Koussios
- 40 Integration of Electrodes for Damage Detection and Repair in Composite Laminates
J. S. Park H. T. Hahn
- 79 An Elastic-Plastic and Strength Prediction Model for Injection-Molded Long-Fiber Thermoplastics
B. N. Nguyen V. Kunc J. H. Phelps C. L. Tucker III S. K. Bapanapalli
- 47 Ecofriendly Plastics from Biofiber and Biodegradable Polymers
S. Sahoo A. Nakai S. K. Nayak M. Misra A. Mohanty H. Hamada

ADT: Numerical Modeling

Tuesday 2:00 PM 5:00 PM

- 11 Assessment of Delamination Propagation Capabilities in Commercial Finite Element Codes
R. Krueger
- 128 Modeling Ballistic Impact onto Stacked Woven Fabrics
M. P. Rao M. Keefe B. M. Powers T. A. Bogetti
- 23 Modeling Energy Absorption of Composite Structures with a Coupled Damage-Plasticity Model
X. Xiao
- 149 Multilayer 2D Numerical Model for Z-Pin Composites
H. Huang A. M. Waas
- 169 Multidisciplinary Shape and Layup Optimization of a Bendable UAV Wing
V. Jagdale B. Stanford P. Ifju
- 29 Influence of Laminate Thickness Approximation Methods on the Performance of Optimal Filamentary Pressure Vessels
S. Koussios A. Beukers

ADT: Testing I

Tuesday 2:00 PM 5:00 PM

- 60 Impact Behavior of Nanoparticulate-Adhesive Bonded Composites
B. Demissie E. Woldesenbet
- 17 Dynamic Crushing of Composite Structures: Experiment and Simulation
M. Rassaian A. Byar F. Deleo P. Feraboli
- 2 Dynamic Crush Response of RTM vs. Roll Wrapped Composite Crash Boxes
A. L. Browne N. J. Johnson M. E. Botkin
- 41 Influence of Geometry on the Stability Characteristics of Bi-stable Cross-ply Laminates
S. Tawfik D. S. Dancila M. Tadros E. Armanios
- 57 Properties of Nanoparticulate Syntactic Foams at High Microballoon Volume Fraction
S. Peter E. Woldesenbet

ET: Testing of Nanocomposites I

Tuesday 2:00 PM 5:00 PM

- 71 Impact, Shock and Hopkinson Tests
P. R. Mantena S. Gupta A. Al-Ostaz
- 84 The Effect of Nano Particles Into Sandwich Composites Energy Absorption and Failure Mechanism
A. F. Avila E. C. Dias D. G. de Sousa D. T. L. da Cruz G. C. B. Barreto
- 151 Experimental Study on Thermal and Mechanical Properties of Clay Modified Carbon Fiber Reinforced Epoxy
Y. Zhou S. Jeelani T. E. Lacy M. F. Horstemeyer
- 5 Thermomechanical Response of a Nanoreinforced Laminated Composite Material
J. L. Abot Y. Song
- 101 Interlaminar Fracture Toughness of Laminates Reinforced with Aligned Carbon Nanotubes (CNTs): Model-experimental Correlation
B. L. Wardle E. J. Garcia R. G. deVilloria S. Wicks K. Ishiguro

MP: Textiles, Fibers, and Preforms

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- 144 Fabrication and Mechanical Properties of Unidirectional Oriented Braided Composites with Middle-end-fiber
M. Shinokubo A. Ohtani A. Nakai H. Hamada
- 64 Effect of Processing Parameters on the Strength of Resin Infused Polyamide-6 Impregnated Glass Fabric Composite
B. Giefer P. K. Mallick
- 36 Modeling the Manufacture of a Layered Fiber/Metal Hybrid Composite by the VARTM Process
G. Tuncol A. C. Loos R. J. Cano
- 141 Mechanical Properties of Hybrid Braided Composite Tube
Y. Sasaki Y. Kobayashi A. Ohtani A. Nakai H. Hamada
- 139 Initial Fracture and Crack Progress of Off-axis Glass Woven Composites
A. Odawara T. Sugie A. Nakai H. Hamada
- 120 Automated Scarfing for Contoured Composite Structures
E. A. Erlbacher L. E. Godwin

Open Session 1

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Reddy Symposium II

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- 114 Fiber Boundary Layer in the Off-axis Coupon
A. Ritchey R. B. Pipes
- 96 A Novel, Multiscale High Fidelity Progressive Damage and Failure Modeling Approach for Laminated Fiber Reinforced Composites
E. J. Pineda A. M. Waas B. A. Bednarczyk C. S. Collier P. Yarrington
- 100 Characterization of Light Weight Composite Proppants
M. C. Kulkarni O. O. Ochoa
- 104 Multi-Functional Composite Fatigue
C. C. Chamis
- 118 Multiscale Biomechanical Analysis of Uterine Tissue
V. U. Unnikrishnan G. U. Unnikrishnan J. N. Reddy
- 112 Viscoelastic Designer Composite Materials
H. H. Hilton

ASC Keynote

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ADT: Modeling & Analysis I

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- 48 Electro-Thermo-Mechanical Coupling in Composites
O. I. Zhupanska R. L. Sierakowski
- 170 On the Use of the Separated J-Integral and p-Version of the Finite Element Method for the Computation of the Energy Release Rate Components for Cracks in Composite Materials
R. L. Actis S. Nervi
- 38 Effective Longitudinal Anisotropy of a Fiber-Reinforced Composite with Rectangular Symmetry: Elastic Orthotropic Case
G. G. Nava-Gomez H. Camacho-Montes F. J. Sabina R. Rodriguez-Ramos
- 30 Continuity of Solutions Obtained by Lekhnitskii's Theory for Anisotropic Plates: Sign Selection Strategies
S. Koussios A. Beukers

ADT: Testing II

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- 42 Development of a Failure Criterion for Cavitation and Debonding Induced Failure under Transverse Loading in Multi-fiber Composites Using the Cruciform Specimen Geometry
D. C. Foster G. P. Tandon M. Zoghi
- 56 Effect of Structure on Electrical Conductance of Single Wall Carbon Nanotubes
S. Akanda J. Ingram Y. Zhou S. Jeelani
- 138 Investigations of Nano Composites Containing Carbon Nanotubes by TEM and a Home Made SEM
F. Deng T. Ogasawara N. Takeda
- 99 Vibration Testing of a Carbon Composite Fuselage
J. Simsiriwong R. W. Sullivan
- 1 Investigation of the Pumping Action of a Barrel Composite Shell Structure
H. Ghoneim

DDT: Durability & Damage Tolerance

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- 106 Effect of Environmental Degradation on Interlaminar Strength of Carbon/Epoxy Composites
S. Goruganthu S. A. Chawla A. Nair S. Roy A. Haque P. K. Dutta A. Kumar
- 34 Thermo-oxidative Degradation of a Carbon Fiber Reinforced Epoxy Composite Used in Rehabilitation of Civil Infrastructures
V. M. Karbhari G. Xian S. Hong
- 88 Interaction of Oxidation, Stress and Damage in High Temperature Polymeric Matrix Composites
K. Pochiraju G. P. Tandon G. Schoeppner
- 80 Developing a Stochastic Model to Predict the Strength and Crack Path of Random Composites
H. Alkhateb A. Al-Ostaz K. I. Alzebdeh
- 133 Impact Damage Resistance and Compression-After-Impact Strength of Sandwich Composites with Graphite-Epoxy Facesheets and Nomex Honeycomb
Y. Hwang T. E. Lacy M. Garg G. Alubmeri
- 136 Reliability-based Evaluation of Composite Structure Damage Tolerance Related to Structural/Aeroelastic Failure Mechanisms
A. V. Styuart C.-H. E. Cheung E. Livne K. Y. Lin

ET: Testing of Nanocomposites II

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- 82 An Investigation on Nanocomposites Damage Tolerance
A. F. Avila M. Alves R. C. Santiago
- 74 Investigation of the Effect of Nanoclay on the Moisture Absorption Behavior of Polyurethane Foams
S. Mohan A. Balakrishnan M. C. Saha
- 152 Effect of Strain Rates on Energy Absorption of Exfoliated Graphite Platelet and Cloisite Nanoclay Reinforced Vinyl Ester Nanocomposites
S. Gupta P. R. Mantena A. Al-Ostaz
- 81 An Investigation on Nanocomposites under Intense Heat Conditions
A. F. Avila J. H. Koo A. Q. Bracarense
- 18 Effect of Filler Size on the Mechanical and Electrical Properties of Nanostructure-reinforced Epoxy
S. White W. Ding D. Aidun
- 98 Electrical Conductivity and Damage Sensing of Carbon Nanotube-based Composites
C. Li T.-W. Chou

MP: Manufacturing & Processing

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- 39 Fiber Micro-Buckling Model During Cure Process of CFRP
A. Todoroki T. Kiuchi R. Matuzaki
- 137 Evaluation of Temperature Profiles in Thick Composite Parts During Autoclave Processing
T. Shimizu J. C. Kotlik A. R. Arafath A. Poursartip
- 14 In-situ Synthesis and Thermal Properties of ZrO₂/ZrW₂O₈ Composites
L. Sun X. Shi A. Sneller C. Uher P. Kwon
- 31 Effect of Process Modification on the Microstructure and Properties of Fiber Reinforced Metal Matrix Composites
N. Q. Nguyen S. Peterson N. Gupta
- 12 Wetout of High Pull Speed Resin Injection Pultrusion for Tapered Injection Chamber with Multiple Injection Ports
A. L. Jeswani J. A. Roux J. Vaughan
- 13 Development and Analysis of a Hybrid Reinforced Composite Material for Solid Rocket Motor Insulation
A. F. Ahmed S. V. Hoa

Reddy Symposium III

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- 122 Multi-scale Modeling of Composite Solids with Damage
R. Talreja
- 127 Implementation of Bi-stable Composite Concept for Wing Morphing
S. Tawfik D. S. Dancila E. Armanios
- 129 Multi-Fidelity Design Optimization of a Composite Thermal Protection System for Spacecraft Reentry
A. Sharma B. V. Sankar R. T. Haftka
- 132 Why LEFM is not Applicable for Bonded Joints
C. T. Sun
- 126 Overview of Hygrothermally Stable Laminates with Out-of-plane Coupling
R. Haynes R. Cross E. Armanios
- 117 Effects of Temperature on Fracture Toughness of Core-Shell Rubber (CSR)-toughened Epoxy Nanocomposites
J. Wang S. A. Cannon J. A. Schneider

ADT: Modeling & Analysis II

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- 167 Place Holder
- 52 Mechanics of Core Materials for Sandwich Structures
S. Abrate
- 54 Compression Strength Prediction of Impact-damaged Composite Sandwich Panels
J. G. Ratcliffe W. C. Jackson
- 131 Modeling Crashworthiness of Composites Using ABAQUS
K. Indermuehle

APP: Implementations

Wednesday 2:00 PM 3:15 PM

20 Implementation of Cognitive Learning Approach in a Mechanics of Materials Course through Integration of Laboratory Modules

N. Gupta

97 Development of Multifunctional Structural Composites for Energy Harvesting

T. Pereira S. Nieh H. T. Hahn

87 Glucose/O₂ Biofuel Cell Based on CNT Modified Electrodes

J.-E. Ryu D. S. Choi H. T. Hahn

APP: Infrastructure

Wednesday 2:00 PM 3:15 PM

35 Rapid Construction of Decks for Box-girder Sections Using FRP Stay-in-place Structural Formwork

A. Goodman V. M. Karbhari

146 Transverse FRP Composite Reinforcements for Improving Shear Performance and Ply Engagement of Glued-laminated Timbers

R. Gentry J. Schwartz S. Hensey C. Chang

75 Use of Nano-particle Enhanced Composites to Reduce Blast Vulnerability of Low Rise RC Frame Buildings

M. Russell C. L. Mullen

Open Mini Session 1

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Open Mini Session 2

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ET: Characterization of Nanocomposites

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89 Development and Characterization of Multiscale Multifunctional Composites

J. Cho D. Dikin I. M. Daniel

108 Characterization of Neat and Nanophased Epoxy Polymers Subjected to Accelerated Aging Conditions

S. Zainuddin M. V. Hosur Y. Zhou A. Kumar S. Jeelani

59 Characterization of Functionally Gradient Syntactic Foam

K. Chittineni E. Woldesenbet

61 Low Velocity Impact Behavior Nanoparticulate Syntactic Foam Sandwich Structured Composites

N. Sankella E. Woldesenbet

83 An Investigation on Carbon-Nylon Nanomembranes

A. F. Avila P. C. da Costa Pinheiro

91 Electrically Modified Nanocomposites

A. Sharma V. Tomar C. E. Bakis C. A. Randall

Analysis, Design, and Test Technical Division

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Applications Technical Division

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Durability & Damage Tolerance Technical Division

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Education Technical Division

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Emerging Composites Technologies Technical Divisio

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Manufacturing & Processing Technical Division

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ASTM D-30 Lecture

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ADT: Design

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- 73 Design and Manufacture of a Composite Cylinder with Circumferentially Varying Stiffness
A. W. Blom Z. Gurdal J. List

- 21 Optimal Shapes and Winding Parameters for Filament Wound Articulated Pressure Vessels
L. Zu S. Koussios A. Beukers

- 22 Pattern Design and Optimization for Filament-wound Toroidal Pressure Vessels
L. Zu S. Koussios A. Beukers

- 125 Design and Analysis of Tow-steered Composite Shells
K. C. Wu

- 10 Dimension and Stacking Sequence Optimization of Rocket Interstage Composite Structure
A. Todoroki M. Sekishiro

- 143 Design of Carbon Fiber Hybrid - PAN/Pitch- Flat Braided Fabric Composites
Y. Kobayashi Y. Sasaki A. Ohtani S. Okajima M. Aly-Hassan A. Nakai H. Hamada H. Hatta

ADT: Testing III

Thursday 9:15 AM 12:15 PM

- 19 Characterization of Quasi-static and Dynamic Response of Functionally Graded Composites
D. Anh Vo An N. Gupta

- 115 Effective Concentrated Load Transfer to Flexible Composite Airship Envelope Laminates
D. S. Dancila

- 7 On the Effect of Fiber Architecture on the Interlaminar Mechanical Response of Laminated Composite Materials
J. L. Abot K. Harsley

- 110 Strength of Composite Angle Bracket with Nano-enhanced Resins
S. Avalon S. L. Donaldson

- 147 Damage Identification in Laminated Composites Using Spectral Data
V. Ranatunga K. Singh

- 130 Stress-rupture of GFRP Composite Materials Using Time-temperature Superposition Principle
R. W. Sullivan D. L. Erdmann III N. Post J. Simsiriwong

DDT: Fatigue, Fracture & Residual Strength

Thursday 9:15 AM 12:15 PM

- 123 Dynamic Mode-II Crack Propagation in Z-Pinned Composites
H. Huang A. M. Waas
- 145 Failure Modes and Strength of Glass/Vinyl Ester Face Sheet-Eco-Core Sandwich Panel
H. Chen K. Shivakumar
- 9 In Situ Calibration of Cohesive Zone Models for Composite Damage
A. J. Moffat P. Wright J.-Y. Buffiere I. Sinclair S. M. Spearing
- 105 Characterization of the Effects of Lay-up, Stress Ratio and Hole Condition in Graphite Epoxies Using Radiography
J. K. Rast W. S. Johnson
- 86 Quick Repairs of Composite Structures
H. S. Roh C. T. Sun R. B. Pipes
- 16 Damage Resistance of Composites under Electrical Loading
P. Feraboli M. Miller

ET: Modeling of Nanocomposites

Thursday 9:15 AM 12:15 PM

- 33 Molecular Dynamics Simulation of Adhesion at Epoxy Interfaces
S. J. V. Frankland T. C. Clancy T. S. Gates
- 76 Molecular Dynamic Simulation of Nano Composites and Their Constituents
H. Alkhateb W. Wu A. Al-Ostaz P. R. Mantena A. Cheng
- 90 Scale-dependent Performance of Piezo-composites
N. Pinilla K. Pochiraju
- 78 Particle Modeling for Dynamic Fracture Problems with Large Poisson Ratios
G. Wang A. Al-Ostaz A.H.-D. Cheng P. R. Mantena
- 27 Nanotechnology Training for Engineers: Tearing Down Traditional Walls
R. Maguire M. Richey W.-H. K. Zhong

ET: Smart Structures & Health Monitoring

Thursday 9:15 AM 12:15 PM

44 Damage Identification of Quasi-isotropic Graphite/Epoxy Laminates Using Electrical Resistance Change

Y. Samejima Y. Hirano A. Todoroki R. Matsuzaki

15 Damage Characterization of Electrified Composite Plates, Part II

M. Miller P. Feraboli

25 Damage Characterization in Laminated Composites Using Drop-Weight Testing

G. P. Tandon R. Y. Kim

32 Encapsulation of Micro-Optical Sensors for Applications of Stress Measurement

N. Q. Nguyen N. Gupta

150 Novel Method of Self-Healing of Composites

N. Fikru E. Woldesenbet

Open Session 2

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