



## **ICAF-2014**

# **2<sup>nd</sup> International Conference on Airworthiness & Fatigue 8<sup>th</sup> ICSAELS Conference Series**

## **Technical Program**

### **Organized by:**



### **Edited by:**

George C. Sih

Konstantinos Tserpes

### **Sponsors:**

International Center of Sustainability, Accountability, and  
Eco-Affordability for Large & Small (ICSAELS)



Research Committee of University of Patras

# Technical Program of ICAF-2014

## Monday, July 14

09:00 – 10:00 Registration

10:00 – 10:30 Opening

### Keynote Session 1

Chairman: K.I. Tserpes

10:30 – 11:00 Fatigue Crack Growth of Aircraft Structure: Sensitivity of Material Parameters  
*S.M.O. Tavares, P.M.S.T. de Castro*

11:00 – 11:30 Fatigue-Creep Crack Growth Characteristics of  $\alpha+\beta$  Titanium Alloys: Transition of Data in Segments of Macro-Micro-Nano  
*G.C. Sih, K.K. Tang*

### 11:30 – 12:00 Coffee break

### Special Guest Lectures 1

Chairman: G.C. Sih

12:00 – 12:30 Research related to fatigue durability and structural health monitoring for aircrafts in Russia  
*S. Panin, V. Panin, V. Sergeev, M. Burkov, P. Luybutin, I. Vlasov*

12:30 – 13:00 Fatigue Life Prediction and Surface Enhancement of Aeronautical Materials in China  
*Yukui Gao, Zheng Zhong*

### 13:00 – 14:00 Lunch

### Session Lectures 1

Chairman: S.M.O. Tavares

14:00 – 14:20 Assessment of the bonding quality of adhesive U-joints using ultrasonic inspection and ILSS tests  
*Ch.V. Katsiropoulos, Sp.G. Pantelakis*

14:20 – 14:40 Anti-penetration of steel-fibre reinforced steel/aluminum plates welded by explosives  
*Wang Jinxiang, Zhou Nan, Chen Zhihua*

14:40 – 15:00 The Crack Path Stability in DCB Specimen under Impact Loading  
*F. Th. Givannaki, D. A. Zacharopoulos, B. G. Badalouka, G. A. Papadopoulos*

### 15:00 – 15:30 Coffee break

### Session Lectures 2

Chairman: R. Ruzek

15:30 – 15:50 The Use of the Hilbert-Huang Transform for Damage Detection in Aluminium beam Structures. An Experimental Approach  
*P.G. Nikolakopoulos, A.B. Zavos, D.A. Bompos*

15:50 – 16:10 Application of Airworthiness Regulations on Friction Stir Welded Structures Considering Kissing Bond Defects  
*Roman Ruzek, Martin Kadlec*

16:10 – 16:30 The ultrasonic test for the evaluation of performance of concrete airport pavements  
*L. Nobile, M. Bonagura, M. Nobile*

**End of Day 1**

# Technical Program of ICAF-2014

**Tuesday, July 15**

09:00 – 09:30 Registration

## Keynote Session 2

Chairman: S. Panin

09:30 – 10:00 A Corrosion Damage Quantification Approach for Assessing the Tensile Behavior of Corroded Aluminum Alloy 2024  
*Sp.G. Pantelakis, D.D. Setsika, K.I. Tserpes, A.N. Chamos*

10:00 – 10:30 Linear and Nonlinear Lamb Wave SHM Methods for Composite Materials and Structures  
*D. Saravanos*

**10:30 – 11:00 Coffee break**

## Session Lectures 3

Chairman: Sp. Pantelakis

11:00 – 11:20 The initiation fracture resistance JQ definition and a practical effect of the phenomenon on the crack growth retardation  
*Jiri Běhal, Petr Homola, Roman Růžek*

11:20 – 11:40 The challenge of achieving cost-effective repair processes for composite passenger aircraft  
*A.G. Gibson, G. Kotsikos, E. Wong*

11:40 – 12:00 Discussion on Uncertainties in Numerical Analysis of Adhesive Joints with Varying Thickness and Material Properties  
*A. Adomeit, A. Dafnis*

12:00 – 12:20 The role of existing strength gradient on fatigue crack growth rate of bare and clad 2024 AA  
*A. Tzamtzis, A.T. Kermanidis*

**12:20 – 14:00 Lunch**

## Special Guest Lectures 2

Chairman: Yukui Gao

14:00 – 14:30 Fatigue of Polymer Composites: Characterization, Analysis and Interpretation of Fatigue Crack Growth  
*Steffen Stelzer, Andreas J. Brunner, Rhys Jones*

## Session Lectures 4

Chairman: Wan Jinxiang

14:30 – 14:50 A Multi-scale FE Modeling Approach for Predicting Strength of Carbon Nanotube-Doped Composite Structures  
*A. Chanteli, K.I. Tserpes*

14:50 – 15:10 Bi-Stable Cylindrical Shell Structure with Piezoelectric Surface Layer  
*G. H. Nie, B. Wang*

**End of Day 2**

**20:00 – 22:30 Banquet**

# Technical Program of ICAF-2014

## Wednesday, July 16

09:00 – 09:30 Registration

### Keynote Session 3

Chairman: G.H. Nie

09:30 – 10:00 AIRWORTHINESS & NEW DEVELOPMENTS IN AIRCRAFT STRUCTURES  
*D. Papacostas*

10:00 – 10:30 Advantages of the Strain Energy Density for Multiaxial Fatigue Assessment of Sharp and Blunt V-Notches  
*F. Berto, P. Lazzarin, Alberto Campagnolo*

### Session Lectures 5

Chairman: P. Lazzarin

10:30 – 10:50 Fracture of the Right-Hand Main Landing Gear of a BAE Jetstream SX-SKY Aircraft  
*T.G. Chondros, G. Mavrantonakis, N. Tsagarakis, E. Vergis, D. Pangalos, I.T. Chondrou*

10:50 – 11:10 Acoustic fatigue life assessment of stiffened composite plate  
*Yadong Zhou, Qingguo Fei, Shaoqing Wu*

### 11:10 – 11:40 Coffee break

### Session Lectures 6

Chairman: F. Berto

11:40 – 12:00 Simulation and material properties of Selective Laser Melting cellular parts  
*E. Ptochos, G. Labeas*

12:00 – 12:20 *Efficient non-linear analysis methodology of large composite structures*  
*I. Diamantakos, N. Perogamvros, G. Labeas*

12:20 – 12:40 Finite element based optimization of bonded repairs with respect to strength and fatigue life  
*P. Papanikos*

12:40 – 13:00 Passenger Car Engine Mount Connection Failure and Design for Redundancy  
*T.G. Chondros, A.S. Papadogiannis, I.T. Chondrou, P. Konstantinidis*

### 13:00 – 14:00 Lunch

### Session Lectures 7

Chairman: T.G. Chondros

14:00 – 14:20 Buckling analysis of imperfect carbon nanotubes: A numerical investigation  
*P.K. Pierou, S.K. Georgantinos, G.I. Giannopoulos, N.K. Anifantis*

14:20 – 14:40 Performance qualification for a structural health monitoring system aimed to fatigue crack diagnosis on helicopter fuselage  
*C. Sbarufatti, A. Manes, M. Giglio*

### 14:40 – 15:10 Coffee break

### 15:10 – 16:00 Closing & Panel discussion

**End of Conference**