



Second International Symposium on Risk Analysis and Safety of Complex Structures and Components (IRAS 2023)

Editorial of the 2nd IRAS conference

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Abstract

The Second International Symposium on Risk Analysis and Safety of Complex Structures and Components (IRAS 2023) took place between 2-4 April 2023 at the Faculty of Mechanical Engineering of the University of Belgrade. The guest editors of the IRAS 2023 deeply acknowledge all members of the International Scientific Committee, Thematic Sessions Organizers, Keynote Speakers and authors that contributed to the success of this event, which gathered more than 90 participants presenting 88 papers on the spot or online. Sponsors are also fully acknowledged for their important contributions. The ESIS/TC12 2023 winners of the “Robert Moskovic” Award, Award of Merit TC12, and ESIS/TC12 Young Scientist Award were announced during the conference. Additionally, guest editors (conference chairs) sincerely thank the tireless efforts of the Organizing Committee members, as well as students and other staff involved in the organization. Finally, the guest editors are pleased to inform that the third edition of the IRAS event will be organized by Prof. Grzegorz Lesiuk (University of Wrocław, Poland) and will take place in Wrocław in Poland in 2025.

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Peer-review under responsibility of the IRAS 2023 organizers

Keywords: Risk analysis; Safety; Structural integrity; Fatigue; Fracture mechanics; Complex structures; Structural components.

1. Introduction

The First International Symposium on Risk Analysis and Safety of Complex Structures and Components (IRAS 2019) was organised by ESIS TC12, and took place between 1-2 July 2019 at the Faculty of Engineering of the University of Porto, Portugal. This conference attracted a large number of participants and was an excellent forum for discussion of the recent advances in risk analysis and safety of large Structures and Components. Having in mind its big success, TC12 Secretariat (co-chairmen Jose Correia, Aleksandar Sedmak and Vladimir Moskvichev, as well as scientific secretaries Abilio de Jesus, Elena Fedorova and Snežana Kirin) decided to organize the 2nd IRAS Symposium in Belgrade in 2021. Unfortunately, due to Covid 19 pandemia, we had to postpone it until 2-4 April 2023

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in mixed mode, on the spot and online. 2nd IRAS is organized by European Structural Integrity Society (ESIS) TC12 and (Serbian) Society for Structural Integrity and Life “Prof. Dr. Stojan Sedmak”.

The IRAS 2023 event had two keynote lecture sessions, with 7 presentations in total:

- Liviu Marsavaina (*University Politehnica Timisoara, Romania*) “The Size and Notch Effect on Additive Manufactured Polymers”
- Abilio M.P. de Jesus (*Faculty of Engineering of the University of Porto, Portugal*), “Exploring the Local Fatigue Approaches to Improve the Structural Integrity of Metallic Structures and Mechanical Components”
- Chao Gao (*Norwegian University of Science and Technology of Trondheim, Norway*) “Bioinspired strategy to break trade-off between strength and toughness”
- Dražan Kozak (*University of Slavonski Brod, Mechanical Engineering Faculty, Croatia*) “Structural Health Monitoring by Embedded System for Remote Strain Gauge Measurement”
- Nenad Gubelj (University of Maribor, Faculty of Mechanical Engineering, Slovenia) “Fatigue lifetime of a howitzer cannon”
- Sreten Mastilović (*Institute for Multidisciplinary Research, University of Belgrade, Serbia*) “Size-Effect in Fracture Mechanics Testing by Using the Weibull J_c Cumulative Distribution Function”
- Aleksandar Milivojević (*Faculty of Mechanical Engineering, University of Belgrade, Serbia*) “The use of hydrogen as an additive”

Within 7 technical and 2 promotional sessions, 88 talks were presented by more than 90 participants on various aspects of risk analysis and safety of complex structures and components. The second edition of the IRAS Symposium gathered participants from 24 countries demonstrating the worldwide acceptance of this event.

This conference is firstly followed by Book of abstracts, while this Volume of Procedia Structural Engineering contains 52 manuscripts, selected out of 63 submitted.

The Organizing Committee of the IRAS 2023 deeply acknowledges all authors that contributed to the success of this event. The members of the International Scientific Committee are also fully acknowledged for their support to the IRAS 2023 event. Sponsors are also fully acknowledged for their important contributions. Finally, the guest editors sincerely thank the tireless efforts of Organizing Committee members, as well as students and other staff from the Faculty of Mechanical Engineering, University of Belgrade.

2. Topics of the conference

The topics of the conference included:

- Methods for reliability and probabilistic safety assessment
- Sensitivity analysis
- Data collection and analysis
- Hydrogen Embrittlement
- Design and evaluation of technical systems and structures
- Design innovation for safety and reliability
- Codes, standards and safety criteria
- Engineering Structures
- Structural Integrity and durability
- Management and life-cycle performance
- Models for ageing and life extension
- Fatigue, fracture and damage mechanics
- Damage evaluation and fatigue design
- Dynamic and fatigue reliabilities
- Safety assessment (loads and environmental effects; material properties; prediction of response and performance)
- Analytical and numerical simulation
- Structural health monitoring
- Rock and soil structural integrity

3. TC12/ESIS awards

Awards (“Robert Moskovic” Award; Award of Merit and Young Scientist Award) are another important activity of TC12. In 2020 the “Robert Moskovic” Award was attributed to:

- Prof. Neil James, Plymouth University, UK, for contributions in the Fatigue and Fracture of Structural Alloys and Materials field;
- Prof. Rui Calçada, University of Porto, Portugal, for contributions in the Integrity of Railway Structures and Infrastructures field;
- Prof. Vladimir Moskvichev, Russian Academy of Sciences, Russia, for contributions in the Risk Analysis and Safety of Technical Systems field.

In 2021 the “Robert Moskovic” Award was attributed to:

- Prof. Filippo Berto, Norwegian University of Science and Technology, Norway, for contributions in the Local Approaches for Fracture and Fatigue Assessment field;
- Prof. Milan Veljkovic, Delft University of Technology, Netherlands, for contributions in the Integrity of Steel Structures field;
- Prof. Maria Feng, Columbia University, USA, for contributions in the Safety and Sustainability of Civil Infrastructure Systems field.

In 2022, the Robert Moskovic Award is attributed to:

- Prof. Hryhoriy Nykyforchyn, Karpenko Physico-Mechanical Institute, National Academy of Sciences of Ukraine, Ukraine, for contributions in the Corrosion-Hydrogen Degradation and Materials Protection field;
- Dr. John Michopoulos, Naval Research Laboratory, Washington DC, USA, for contributions in the Computational, Theoretical and Experimental Multiphysics field;
- Prof. Grzegorz Lesiuk, Wrocław University of Science and Technology, Poland, for contributions in the Fatigue Crack Growth Analysis field.

In 2022, the Robert Moskovic Award is attributed to:

- Prof. Doctor Aleksandar Grbovic, University of Belgrade, Serbia, for an outstanding contribution to Fatigue Crack Growth Simulation
- Prof. Doctor Marc André Meyers, University of California San Diego, USA for an outstanding contribution to Dynamic Behavior of Materials and Characterization of New Materials
- Doctor Motomichi Koyama, Institute for Materials Research, Tohoku, University, Japan for an outstanding contribution to Material Resistance to Hydrogen Cracking

The Award of Merit TC12 was attributed to the following researchers for their contributions to IRAS in 2023:

- Prof. Abílio De Jesus, University of Porto, Portugal
- Doctor Branislav Djordjevic, Innovation Center of the Faculty of Mechanical Engineering, Belgrade, Serbia
- Doctor Simon Sedmak, Innovation Center of the Faculty of Mechanical Engineering, Belgrade, Serbia

The ESIS/TC12 Young Scientist Award was attributed to Dr. Dorin Radu, Faculty of Civil Engineering, University of Brasov, Romania, for his scientific work.

Acknowledgements

The guest editors of this Volume would like to express a special thanks to Professor Francesco Iacoviello, Editor-in-Chief of *Procedia Structural Integrity* journal, and to Elsevier staff for their support during the preparation of this issue. On behalf of the Organizing committee, guest editors send their gratitude to European Structural Integrity Society (ESIS), as well as all the sponsors of the event: TankMont (Serbia); Mont-R (Serbia); TrokutTest Group (Serbia); Metal Rehabilitation and Testing Ltd (Serbia); Institute de Soudure/Welding Institute (Serbia); Weld-Ing (Serbia); Innovation Center of Faculty of Mechanical Engineering in Belgrade (Serbia); Faculty of Mechanical Engineering in Belgrade (Serbia); The Bay Zoltan Nonprofit Ltd. for Applied Research (Hungary). Special thanks is attributed to Ministry of Science, Technological Development and Innovation of the Republic of Serbia.