

Preface

The present Special Issue of the journal *Applied Mechanics and Materials* contains a selection of papers presented at the 21st International Conference on Engineering Mechanics, which has been held in Svratka resort in Czech Republic under auspices of the Czech Society of Mechanics and being a part of IFTOMM (The International Federation for the Promotion of Mechanism and Machine Science) activities. Organization of the Conference has been entrusted this year to the Institute of Theoretical and Applied mechanics. The International Scientific Committee selected in collaboration with session chairmen the best papers and respective authors were subsequently invited to prepare revised and amended versions for submission to the Special Issue. As a result of the reviewing process 106 manuscripts were included into the final set of papers. It is challenging that some a half of authors are young people.

As it corresponds with character of the conference also this Special Issue consists of several topic oriented parts: Linear and Nonlinear Dynamics and Stability, Aeroelasticity, Hydroelasticity and Fluid Mechanics, Biomechanics, Fracture Mechanics, Mechatronics, Reliability of Structures, Mechanics of Solids, Thermomechanics. I am convinced that this volume represents a well-balanced overview of theoretical, numerical and experimental work on fundamental and applied studies.

Looking through the volume we can notice very promising trends. Many challenging topics appeared being investigated using sophisticated combinations of analytic and numeric procedures. Non-conventional methods motivated by various aspects of topology are being developed and applied immediately in relevant papers. Research is adopting more and more discrete models inspired by principles of digital technology itself. Uncertainty modeling is making a good progress offering various attitudes concerning type and information extent available. Non-linear problems of every type related with flow induced vibrations are widely discussed providing applicable results not only in basic but also in applied research and industry.

Take a note that the above-mentioned sections are mostly of the multidisciplinary character and so are individual papers. So we can see an excellent environment inspiring the creation of new unconventional ideas, their immediate application and emerging of new disciplines. Consequently, mechanics reaffirms again the role of the birthplace of scientific directions which later penetrated into mathematics, physics and other fields.

I would like to express my gratitude to all authors for their valuable contributions and their willingness to share their knowledge with other readers. Their contribution became the backbone to achieve the high level of this special volume. I appreciate friendly cooperation of reviewers for their opinion and comments which made it possible to improve the quality of papers. Special thanks are due to the editor Dr. Cyril Fischer for enormous effort he paid for the sake of quality of this volume. My genuine thanks should be addressed to colleagues in publishing house Trans Tech Publications Inc., who supported us during the entire period of the Special Issue preparation.

Jiří Náprstek
Chairman of the 21st Engineering Mechanics Conference

15 October 2015



Committees

HONORARY COMMITTEE:

Miroslav Šabart, MSc.
František Mládek

Managing Director of the ŽĎAS Inc.
Mayor of Svratka

SCIENTIFIC COMMITTEE:

Jiří Náprstek, DSc (chairman)	ITAM AS CR, Prague, CZ
Prof. Ján Benčat, PhD.	University of Žilina, SK
Prof. Tomáš Březina, PhD.	Brno University of Technology, CZ
Prof. Jiří Burša, PhD.	Brno University of Technology, Brno, CZ
Assoc. Prof. Vladimír Čech, PhD.	OPROX, a.s., Brno, CZ
Prof. Miloš Drdäcký, DSc.	ITAM AS CR, Prague, CZ
Prof. Paola Forte	University of Pisa, IT
Assoc. Prof. Vladimír Fuis, PhD.	Brno University of Technology & IT AS CR, Brno, CZ
Prof. Ardeshir Guran, PhD.	Institute of Structronics, Ottawa, CA
Prof. Ivo Herle	TU Dresden, DE
Jaromír Horáček, DSc.	Institute of Thermomechanics AS CR, Prague, CZ
Assoc. Prof. Lidia Ilieva-Mitutsova, PhD.	Bulgarian Academy of Sciences, Sofia, BG
Prof. Milan Jirásek, DSc.	Czech Technical University in Prague, CZ
Prof. Zdeněk Kala, PhD.	Brno University of Technology, CZ
Prof. Zbyněk Keršner, PhD.	Brno University of Technology, CZ
Prof. Anne-Maria Laukkanen, PhD.	University of Tampere, FI
Prof. Dušan Maga, PhD.	Czech Technical University in Prague, CZ
Prof. František Maršík, DSc.	Institute of Thermomechanics AS CR, Prague, CZ
Prof. dr. Damijan Miljavec	University of Ljubljana, Ljubljana, SI
Jiří Minster, DSc.	ITAM AS CR, Prague, CZ
Prof. Bořek Patzák, PhD.	Czech Technical University in Prague, CZ
Prof. Michail Pavlenko	National University of Science and Technology "MISIS", RU
Prof. Jindřich Petruška, PhD.	Brno University of Technology, CZ
Jiří Plešek, PhD.	Institute of Thermomechanics AS CR, Prague, CZ
Assoc. Prof. Stanislav Pospíšil, PhD.	ITAM AS CR, Prague, CZ
Prof. Jaromír Příhoda, PhD.	Institute of Thermomechanics AS CR, Prague, CZ
Ladislav Půst, DSc.	Institute of Thermomechanics AS CR, Prague, CZ
Prof. Michal Šejnoha, DSc.	Czech Technical University in Prague, CZ
Prof. Ján Sládek, DSc.	ICA, SAS, Bratislava, SK
Prof. Vladimír Sládek, DSc.	ICA, SAS, Bratislava, SK
Prof. Alexander Tesár, DSc.	ICA, SAS, Bratislava, SK
Prof. Václav Tesař, PhD.	Institute of Thermomechanics AS CR, Prague, CZ
Prof. Pavel Vlasák, DSc.	Institute of Hydrodynamics AS CR, Prague, CZ
Prof. Yuri Sergeevich Vorobiev	NAS of Ukraine, Kharkov, UA
Radek Votrubec, PhD.	Technical University of Liberec, CZ
Prof. Jaroslav Zapoměl, DSc.	Institute of Thermomechanics AS CR, Ostrava, CZ
Prof. Vladimír Zeman, DSc.	University of West Bohemis in Pilsen, CZ
Prof. Anatoly P. Zinkovskii, DSc.	National Academy of Sciences of Ukraine, Kiev, UA
Igor Zolotarev, PhD.	Institute of Thermomechanics AS CR, Prague, CZ
Prof. Rudolf Žitný, PhD.	Czech Technical University in Prague, CZ
Prof. Milan Žmindák, PhD.	University of Žilina, SK

The Conference EM2015 was organized by:

- Institute of Theoretical and Applied Mechanics Academy of Sciences of the Czech Republic, v.v.i.,
- Institute of Solid Mechanics, Mechatronics and Biomechanics, FME, VUT Brno,
- Institute of Thermomechanics Academy of Sciences of the Czech Republic, v. v. i.,
- ŽĎAS, a.s., Žďár nad Sázavou,
- IFTOMM Member Committee of the Czech Republic and,
- Czech Society for Mechanics and Association for Engineering Mechanics