

Preface

The Algerian Congress of Mechanics *Congrès Algérien de Mécanique CAM*, www.cam-dz.org was started in 2007 by members of the Advanced Mechanics Laboratory (LMA) of Houari Boumediene University of Sciences and Technology (USTHB, Algiers, Algeria) with the assistance of the Algerian Association for Technology Transfer (a2t2). The pioneers were Pr. Taoufik Boukharouba, Pr. Krimo Azouaoui and Pr. Nourdine Ouali from USTHB. First time, Pr. Lakhdar Taleb of INSA Rouen, Pr. Nacer Hamzaoui of INSA Lyon, Pr. Moussa Nait Abdelaziz of Polytech'Lille, Pr. Rezak Ayad of the University of Reims, Dr. Salim Benmedakene of Technip France, Pr. Nouredine Ouelaa of University 8 May 1945 of Guelma, and Pr. Abdelkrim Liazid of Polytechnic school of Oran joined the scientific plane group; about Dr. Djamel Sais and Dr. Halim Foudi joined logistic plane.

The first edition of *CAM2007* was organized at USTHB, Algiers in 2007, the second at Biskra in 2009, the third at Guelma in 2011, and the fourth at Mascara in 2013. *CAM* conferences have just finished its fifth edition in 2015 which took place in the city of El-Oued.

Traditionally *CAM2015* provides a forum bringing together researchers from university, research institutions and industry. One of its major objectives is to develop connections between academic and applied research. For that, *CAM* received its essential help from the Algerian Association for Technology Transfer (a2t2). The organization of *CAM2015* provides the frame for constructive exchanges and promoting the development of new ideas in these fields.

CAM is also a place for discussing the major actual world challenges as global warming, decreasing of raw material resources, saving energy, increase of world population and preservation of the environment. To that, *CAM* has organized 10 sessions on the following topics:

1. Cyclic behavior and damage of materials including behavior and fatigue damage of metals, metallic alloys and composites, and high-temperature fatigue. This concerns elastic and plastic behavior by including viscoplasticity, cyclic softening and hardening, shakedown, and ratcheting. Temperature effect

is also taken into account with mechanical and metallurgical interactions, thermal stresses, and stress corrosion cracking (six contributions)

2. Deep drawing and systems manufacturing by automation in the field of non-conventional machining processes (EDM, laser or ultrasonic machining,) mechanics of surfaces and tribology, contacts, friction and interfaces. Modeling of complex systems and mechanisms is also examined (five contributions)
3. Transport and logistics with transport engineering, vehicles reliability of urban transport and safety in urban transport (four contributions)
4. Reagent flows and transport phenomena including mixing phenomena, combustion and reactants turbulence interactions and propulsion systems (six contributions)
5. Fracture mechanics with special attention to local criteria in fracture mechanics, harmfulness of defects and transferability in fatigue and fracture (seven contributions)
6. Structural dynamics, acoustics and industrial maintenance including noise and machines vibration, rotating machines, early diagnosis of failure, cyclostationarity, source separation, monitoring and diagnostics, maintenance managing and mechanical reliability, techniques of defect detection such as NDT, vibro-acoustic, thermography, etc. (nine contributions)
7. Composite materials' advances concerning specially nanocomposites, bio-based natural structural composites, new honeycomb cores and sandwich structures, textile composites and their applications, and fracture and damage mechanics in composite structures and materials. Enhanced methods for composites defects (delamination, matrix and fiber cracks) (13 contributions)
8. Energy, heat, and mass transfer thermodynamics as energy conversion and storage renewable energy, energy efficiency heat transfer, and numerical simulations and experiments (14 contributions)
9. Fluid mechanics and systems engineering concerning applications of computational fluid dynamics, algorithms applied for high-performance calculation, cavitation and multiphase flows, fluid-structure interactions, and also micro-fluidics (11 contributions)
10. Numerical modeling product-driven simulation design and optimization with simulation of manufacturing processes (including industrial and healthcare applications), materials, multiphysics and multiscale modeling (linear and nonlinear behavior, static and dynamic analysis), advances in finite element numerical methods and software engineering (finite element, finite volume, optimization, meshless, parallel programming, solvers, use of commercial software in multiphysics engineering analysis (12 contributions)

Two workshops were added to the conference; the first entitled *Damage-Behavior coupling: From the initiation to the propagation of macroscopic cracks* was animated by Pr. André Dragon, Univ. Poitiers (France), Pr. Djimédo Kondo Univ. Pierre et Marie Curie (France), Pr. Jean-Jacques Marigo, Polytechnic school (France), Pr. Pierre-Yves Manach, Univ. Bretagne-Sud (France) and Pr. Khemais Saanouni, Univ. Technology of Troyes (France).

The second workshop “Advances in Fracture Mechanics” received contribution from Pr. Píška Miroslav, Brno University of Technology (Czech Republic), Pr. Simon A. Sedmak, University of Belgrade (Serbia), and Pr. Ljubica Milovic, University of Belgrade (Serbia).

The scientific contribution of CAM2015 is important: the total number of papers was 387 and 257 were accepted, this led to an acceptance rate of 80.3 %. The total number of participants was 199, with 33 coming from outside Algeria. Participants came from countries such as France, Tunisia, Canada, China, Serbia, Morocco, and UEA.

Totally 12 plenary lectures, 19 introductory lectures, 81 oral presentations, 47 posters, and 12 conferences in the two workshops were presented.

These facts indicate that *CAM* is a major scientific event in North Africa. Its international audience indicates its high scientific level. The next *CAM* will be organized in 2017.

Since June 13, 2015, *CAM* has an institution called “College of Expert, Monitoring and Deontology” (*Collège d’Experts, de Suivi et de Déontologie*) abbreviated as *CESD*. This college will be responsible for overseeing future editions of *CAM* at the organizational and scientific level. The designation of the topics’ coordinators and the host university for the *CAM*, based on a tender will remain its main charge. The *CESD* is composed of 10 members (9 academicians and one from socioeconomic sector), refer to www.a2t2-dz.org.

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