



PEOPLE'S DEMOCRATIC REPUBLIC OF ALGERIA
 MINISTRY OF HIGHER EDUCATION AND SCIENTIFIC RESEARCH
HASSIBA BENBOUALI UNIVERSITY OF CHLEF
FACULTY OF TECHNOLOGY

IN COLLABORATION WITH THE



LABORATORY FOR
 THEORETICAL PHYSICS
 AND MATERIALS PHYSICS
 (LPTPM)

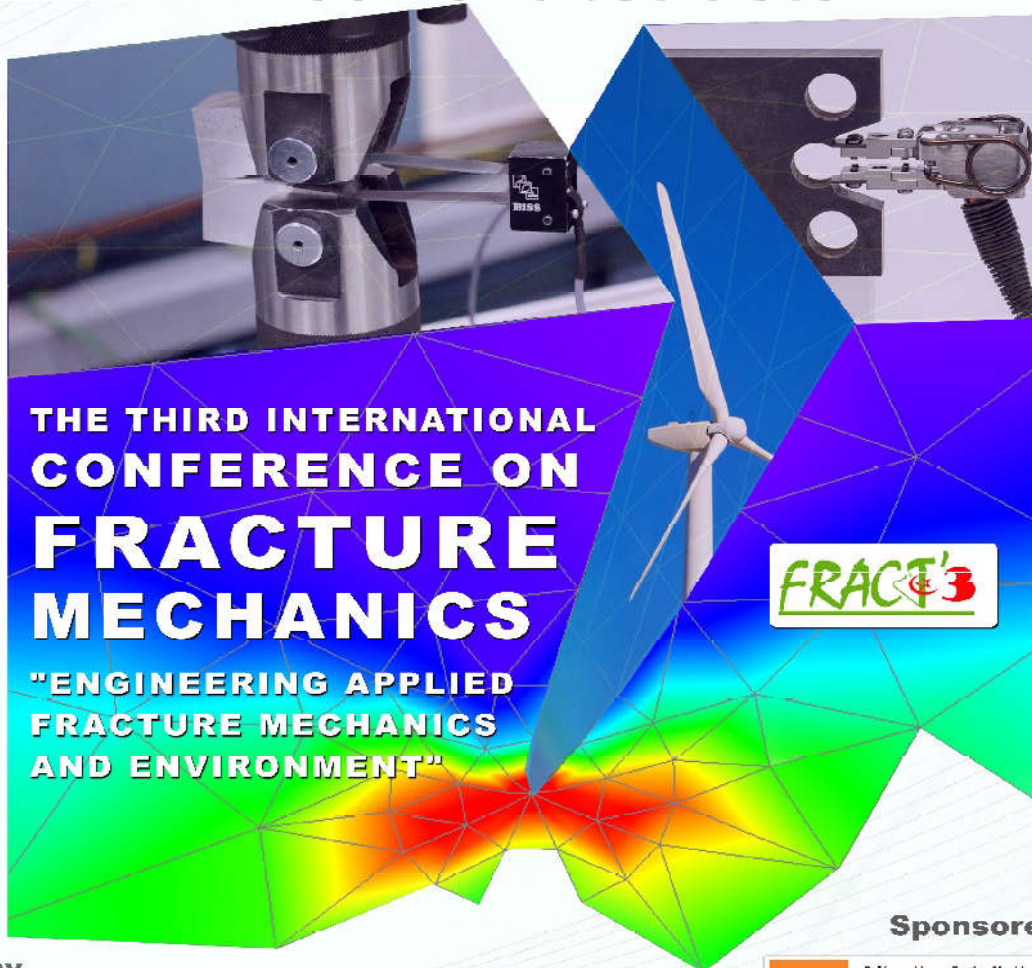
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CHLEF, NOVEMBER 27-30, 2016

Technical Program Fract'3 Conference

Central Bibliotheque, UHBchlef

Monday, November 28th, 2016
Central Bibliotheque, UHBChlef

08:00 – 09:00 Registration

9:00 – 9:25 Opening Ceremony

Represented of the Organizing Committee, Dr.
Represented of the Scientific Committee, Dr. Mohammed Hadj Meliani
Dean of the Faculty of Technology, Dr. Abedi Bouabdellah
Dean of the Faculty of Sciences, Dr. El-Miloudi Khaled
Vice Rector of the exterior relations and animations, Prof. Hassen Mahmoudi.
Rector of the Hassiba Benbouali university of Chlef, Prof. Abdelkader Hocine.

9:25 – 9:30 Eulogy words

In Memoriam of Hassiba Benbouali Martir
Represented of the university.

9:30 – 10:30 Opening Honor Lectures, Chairman's : Prof. Hocine Abdelkader & Dr. M. Hadj Meliani

Gear Failures: A Case Study of Premature Failure of an Industrial Mixer Gearset

Prof. Merah Ammar Nacer,

Mechanical Engineering. Director: Center of Excellence for Scientific Collaboration
with MIT. King Fahd University of Petroleum & Minerals. KSA.
nesar@kfupm.edu.sa



Multiscale Thermal Mechanics beyond Navier-Stokes Approach: Modeling, Simulation
and Applications"

Prof. Naji Hassane

Univ. Artois and Lille University Northern France, LGCgE
(EA 4515), France.
hassane.naji@univ-artois.fr



10:30 – 11:00 Coffee Break

Plenary Lectures Chairs : Prof. Naji Hassene, France

11:00–11:30 Behaviour of 9%cr steel and simulated HAZ at 600°C

Pr. Ijubica MILOVIC,

University of Belgrade, Faculty of Technology
and Metallurgy, Karnegijeva 4, 11120 Belgrade, Serbia
acibulj@tmf.bg.ac.rs.



11:30–12:00 Fracture Modelling and Analysis of Plates with Multiple Site
Cracks under Lateral Pressure

Pr. Željko Božić

Department of Aeronautical Engineering. Faculty of Mechanical
Engineering and Naval Architecture. University of Zagreb.
Croatia.
zeljko.bozic@fsb.hr



12:00 – 14:00 Lunch Time , Faculty of Economic Sciences

Oral Presentation TOPIC (A+B) : Fatigue, Failure Analysis, Criteria of Fracture and Failure, Damage and Micromechanics, Microstructurally Short Cracks, Fracture and Fatigue in Applied Biomechanics, Reliability and Integrity of Engineering Structures, Residual Stresses, Corrosion, Environmentally Assisted Cracking and Corrosion Fatigue, Extended Finite Elements Methods and their Application, Simulation and Testing of Crack Propagation on all Length Scales

Plenary Lectures, Chairs : Professor Y.G. Matvienko, Russia

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14:00 – 14:30

New concepts of modelling and elaboration of materials in order to develop negative Poisson's ratios

Pr : Abderezek Bezzazi

Laboratoire de Mécanique & Structures (LMS),BP. 401 Université 08 Mai 1945
Guelma 24000 Algeria
ar_bezazi@yahoo.com



Oral Presentation, Session (A+B) List 1A and 1B

14:30–14 :40

Com 1 : “**HEAT TREATMENTS EFFECT ON THE FRACTURE TOUGHNESS OF AISI M2 TOOL STEEL**”
M. Benaissa, F. Benkhenafou, S. Belhenini, H. Lebbal, A. Ziadi , F.J.Belzunce
Abou Bakr Belkaid University , Tlemcen, Algeria.

14:40–14 :50

Com 2 : **Elastio-plastic modeling incorporating static strain aging (SSA) effect on the behavior of X5CrNi18-10 stainless steel and C-Mn steel coupled with the damage**
Nardjes DJAOUI, Aghilas HANNOU, Marzek ZEROUKI and Mohand OULD OUALI
Université Mouloud MAMMERI de Tizi-Ouzou, Algeria

14:50–15 :00

Com 3 : **WEAR BEHZVIOR OF ALUMINA COATING OBTAINED BY PLASMA ON AN ALUMINUM SUBSTRACTE**
N. Kennafi-Benghalem, S. Aounallah*, M. Hamidouche, A. Zahri, L. Loucif.
Unité de recherche de matériaux émergents, Sétif, Algeria

15:00–15 :10

Com 4 : **INFLUENCE OF RECYCLED SAND ON MECHANICAL PROPERTIES AND THE DURABILITY OF CEMENT MORTARS**
L. Berredjem1, N. Arabi1 and L. Molez
Badji Mokhtar University, Annaba, Algeria.

Oral Participants of the Section (A+B) List 2A and 2B

15 :30– 15 :40

Com 5 : **EXPERIMENTAL STUDY FOR CORROSION INHIBITION OF CARBON STEEL IN ACIDIC MEDIUM**
R. Mehdaoui, O. Aaboubi, K. Chouchane, A. Khadraoui , A. Khelifa , O. Aaboubi
Laboratoire de Génie Chimique (LGC), Blida, Algeria.

15 :40– 15 :50

Com 6 : **Effect of slag in the mechanical behavior of the alkali-silica reaction affected concrete beams**
Z. Douaissia, M.F.Habita
Badji Mokhtar University, Annaba, Algeria.

15 :50– 16 :00

Com 7 : **Effect of welding current on mechanical behavior of resistance spot welding of stainless steel 304 L sheets**
M. Benachour, M. Larbi Cherif
University of Tlemcen, Tlemcen, Algeria.

16 :00– 16 :10

Com 8 : **Mechanical and numerical characterization of the mild steel (E235) tube under uniaxial compression in quasi-static regime**
M.Zerouki, M. Haouchine, A. Ahmed Ali, M.Ould Ouali
Université Mouloud MAMMERI de Tizi-Ouzou, Algeria.

Oral Presentation TOPIC C : Mechanics, Materials domain and Rheology, Domain , CFD, Heat transfert, Renewable energy

Plenary Lectures, Chairs : Professor Najji Hassen, France

Place : Faculty of Economic Sciences

14:00 – 14:30

Numerical investigation of the geometry influence on the aerodynamic fields of the free turbulent jets

Associ. Prof. Ali Khelil.

Controls, Testing, Measurement and Simulation Mechanical laboratory ,
University of Chlef, Chlef, Algeria
khelila@yahoo.fr



Oral Participants of the Session (C) List 1C

- 14 :30– 14 :40 Com 1 : **On the fouling of ultra-filtration membrane in the pretreatment process of seawater desalination**
Asma Adda, Mohamed Abbas, salah Hanini
University, Medea, Algeria.
- 14 :40– 14 :50 Com 2 : **COMPUTATIONAL STUDY OF FE-DOPED TiO2 NANOPARTICLES**
B. Bezzina1 , , c.e. ramoul, k.e. slimani, o. Ghelloudj, m.t. abed ghars, m. Kahalerras,h.bendjama, d.e. khatmi
Research Centre in Industrial Technology (CRTI), P.O.BOX 64, Cheraga 16014, Algiers
- 14 :50– 15 :00 Com 3 : **EFFECTS OF OXYGEN FLOW RATE ON THE PROPERTIES OF ZNO THIN FILMS PREPARED BY DC REACTIVE MAGNETRON SPUTTERING**
F. Bouarabaa, S. Lamri, N. Ziani, O.Boussoum, M.S.Belkaid
Université Mouloud Mammeri, Laboratoire Des Technologies Avancées Du Génie Electrique, Tizi-Ouzou, Algérie
- 15 :00– 15 :10 Com 4 : **Study on the parameters influencing length interface in multiproduct pipelines**
D. Bennacer, R. Saim, B. Benameur, F. Benkhenafou
Université de Tlemcen, Energétique et Thermique Appliquée (ETAP), B.P 109, 13000, Tlemcen, Algérie
- 15 :10– 15 :20 Com 5 : **Numerical and experimental investigation of dynamic behavior of laminate composite under flexural vibration**
Abdelhafid Rahmane , Toufik. Benmansour
University, Road of ,Ain El Bey, Constantine,Algeria
- 15 :20– 15 :30 Com 6 : **Optical Simulations Of P3ht/Pcbm Bulk- Heterojunction Organic Photovoltaic For Improving Absorption**
F. Brioua, C. Daoudi, H. Bourouina, M.Remram
Laboratoire LEMEAMED , Département d'électronique, Université des Frères Mentouri Constantine ,Algerie
- 15 :30– 15 :40 Com 7 : **Study of dynamics of carriers in InSb/GaAs Quantum Dot Solar cell**
F.Benyettou, A.Aissat
University of Blida, LASICOM, Route de Soumaa, 09000, Blida, Algeria
- 15 :40– 15 :50 Com 8 : **Heat transfer enhancement inside a solar chimney**
M.T.Bouzaher, M. Lebbi, L. Boutina, H. Boualit
1 Unité de Recherche Appliqué en Energies Renouvelables, URAER, Centre de Développement des Energies Renouvelables, CDER, 47133, Ghardaïa, Algeria
- 16 :00– 16 :10 Com 8 : **Investigation Of Aisi 316l Cardiovascular Stent Behaviour Under Bloodpressure And**

Restenosis Loadings
M. Benhaddou, M. Abbadi, M. Ghammouri
ENSA, University of Oujda, Morocco.

15:10– 16:20 Coffee Break

16:20–16:50 Poster session C : Responsable : Prof. Najji Hassen, Prof. Loukarfi Larbi, Dr. Ali Khelil

- Post :1 **THEORETICAL STUDY OF inasxsb1-x / gasquantum WELL SOLAR CELL**
S.Taleb, I.Lagraa
University of Sidi Bel Abbes, Sidi Bel Abbes, Algeria
- Post :2 **Experimental thermal study of turbulent jet swirling: Application in the HVAC systems**
Abderazak BENNIA, Larbi LOUKARFI, Ali KHELIL Hachimi FELLOUAH, Mohamed BRAIKIA, Youcef BOUHAMIDI
Université Hassiba Benbouali of Chlef, Algeria
- Post :3 **Numerical investigation of Heat Transfer Enhancement inside a Parabolic Trough Solar Collector using Geometrical Modification and Hybrid Nanofluid**
Amina Benabderrahmane*, Abdelylah Benazza, Miloud Aminallah, Samir Laouedj
University, Sidi Belabbes. Algeria
- Post :4 **Simulation study of the surface aerator power for the Chlef sewage station**
Aoumeur Djelloul, Madjid Meriem-Benziane
University Hassiba Benbouali of Chlef
- Post :5 **Glass forming ability and crystallization behavior of nickel-based amorphous alloy membranes for hydrogen separation by electronic and calorimetric measurements**
Billel SMILI, Moussa Mayoufi, Ivan KABAN, Jean-Georges GASSER
University Badji Mokhtar of Annaba, Algeria
- Post :6 **Etude comparative entre les corrélations d'identification du transfert de chaleur HTC à l'extérieur d'un tube lisse horizontal.**
Dj. AMGHAR, M. TEBBAL, B. TOUHAMI, H. LAIDOUDI1, F. KEBIR1
University of El-Menaouer, Oran, Algeria
- Post :7 **L'effet de taux d'injection et l'angle d'inclinaison sur l'efficacité du refroidissement par film**
F. Kebir, A. Azzi1, H. Laidoudi, D. Amghar
University of El-Menaouer, Oran, Algeria
- Post :8 **L'Effet d'un Chargement Thermique sur la Variation des Contraintes Résiduelles d'un Assemblage Metal-Ceramique**
K. Messaoudi, F. Bouafia, F. Benkhenafou
Université of Tlemcen, Algérie
- Post :9 **Étude numérique tridimensionnelle de l'écoulement généré par un agitateur de type ANCRE**
KAMLA Youcef, AMEUR Houari, SAHEL Djamel
University Hassiba Ben Bouali of Chlef, Algeria
- Post :10 **The collector radius effects on the mass flow rate in a small-scale solar chimney**
M. Lebbi, A. Bouabdallah, T. Chergui1, H. Boualit, L. Boutina1, M.T. Bouzaher, S. Laouar, M. Lounici
Unité de Recherche Appliquée en Energies Renouvelables, URAER, Centre de Développement des Energies Renouvelables, Ghardaïa, Algeria
- Post :11 **Effect stresses induced by ion exchange in the case of a glass subjected to soft thermal shock**
Z. Malou, T. Benouioua, O. Gridi, M. Hamidouche, G. Fantozzi
Optical and mechanical precision Institute, University of Setif 1, 19000 Algeria
- Post :12 **NATURAL CONVECTION IN A CAVITY SIMULATING A THERMOSYPHON**
Abderazak BENNIA, Samir RAHAL, Ali KHELIL, Ghazali MEBARKI, Larbi LOUKARFI
Université Hassiba Benbouali de Chlef, Algérie
- Post :13 **Solar driven air-conditioning system based on desiccant materials**
L. Merabti, M. Merzouk, N.Kasbadji Merzouk, W. Taane, M. Abbas
Unité de Développement des Equipements Solaires, UDES/Centre de Développement des Energies

- Renouvelables, CDER, 42415, W. Tipaza, Algérie
- Post :14 **Thermal and dynamic characterization of air jet issued from a diffuser provided with lobes.**
M. Braikia *, **A. Khelil**, **L. Loukarfi**, **A. Bennis**,
 Université Hassiba Benbouali of Chlef,, Algérie
- Post :15 **Thermoelectric properties of skutterudite materials**
C.Bouhafs, **M.Chitroub**
 Laboratoire de Science et Génie des Matériaux, Département de Métallurgie, Ecole
 Nationale Polytechnique
 El-Harrach, Alger, Algeria
- Post :16 **Adsorption of anionic dye by zeolite commercial and equilibrium study**
F.Iasnami¹, **a.labbaci**, **m.douani**
 Université Hassiba Benbouali de Chlef, Algérie
- Post :17 **Aerodynamic Shape Optimization of NACA0012 Profile using Adjoint Solver**
Abd Ellatif AMOR; Ramzi MDOUKI; Ahmed BETTAHAR
 University of Chlef, Algeria.
- Post :18 **Water irrigation in the Chlef region using photovoltaic solar energy**
T. Tahri, **H. Zahloul**, **K. E. Meddah**, **H. Lazergue**
 Université Hassiba Benbouali de Chlef, Algérie
- Post :19 **The Distance Effect between the Tubes on Horizontal Ground Heat Exchange**
M. Ben Maachou , **A. Benazza**
 University of Sidi Bel Abbes, Algérie
- Post :20 **Poly-silicon for heterojunction solar cells based on numerical simulations**
ZIANI Nora
 Université Mouloud MAMMERRI of , TiziOuzou, Algeria
- Post :21 **Étude de stabilité de phase de AlN dans les conditions à haut pression**
N. BOUTELDJA, **S. DAHMANE**, **M. TRACHE**, **A. CHENOUNE**, **A. ALIBENAMARA**
 University of Chlef, Algeria
- Post :22 **AB INITIO STUDY OF STRUCTURAL , ELECTRONIC ,OPTICAL AND THERMAL PROPERTIES OF aginte2**
H.BENDJEDDOU ,**A.GASSMI**,**H.MERADJI**,**S.GHEMID**
 Université Badji Mokhtar, Annaba , Algeria
- Post :23 **MECHANICAL CHARACTERIZATION OF THE BEAD Welding of High-Density Polyethylene (HDPE)**
M.BELHOUARI, **A. Belaziz**, **M. Mazari**, **M.Belhouari**
 University Djillali Liabes, Sidi Bel Abbes, Algeria.
- Post :24 **Study of a new geometry of beam welded reconstituted (composite bridges)**
A. Houda , **H. Zedira** ,**B. Redjel**
 University, Abbas Laghrour, kenchela, Algeria
- Post :25 **A Simple Quasi-3D Theory With Five Unknowns For The Static Analysis Of FGM Sandwich Plates**
A. Hamidi, **M. Zidour** , **A. Tounsi**, **E. A.Adda Bedia**
 A. Hamidi, M. Zidour, A. Tounsi, E. A.Adda Bedia
- Post :26 **Comportement dynamique des poutres sandwiches fonctionnellement graduées (FGM)**
L. Hadji, **N. Zouatnia**, **Y. Tlidji**¹, **A. Kassoul**
 Université Ibn Khaldoun, Tiaret, Algérie
- Post :27 **Design and Analysis of Two Gantries in Steel Structures**
O. Belaidi, **F. Taouche-kheloui**, **Kh. Iftene**, **M. Almansba**, **N.E Hannachi**
 University of Tizi Tizi-Ouzou Algeria.
- Post :28 **Flexion statique des poutres composite type 'FGM'**
N. Zouatnia, **L. Hadji**², **A. Kassoul**
 Université Hassiba Benbouali de Chlef, Algérie
- Post :29 **Interfacial Stress Analysis in Multimaterial Metal / ceramic / metal by the method of finite element**
W. Bensmain, **B. Serier**, **H.Fekirini**
 Université Djilali Liabes de Sidi Bel Abbes
- Post :30 **Analyze of interfacial cracks in a composite material subjected to different loads**

Y. Chahraoui, L. Zouambi, F. Bouafia, B. Serier
University of, SidiBel Abbes, Algeria,

- Post: 31 **The effect of cutting parameters on the state of the surfaces of work-pieces (Case Bronze and Aluminum)**
M. Hachellaf kaddour, Oud Chikh el Bahri, Merdji Ali
University of Mustapha Stambouli Mascara, Algeria
- Post: 32 **The Influence of the Methods of Preparation on the Textural and Structural Properties of the Titanium Dioxide**
A.MENNAD, A.MAHIOU
Unité de Développement des Equipements Solaires, UDES / Centre de Développement des Energies Renouvelables, CDER, Bou-Ismaïl, 42415 Tipaza, Algeria.
- Post: 33 **Failure analysis of a gas turbine blade using FEM**
S.Tahraoui, H. kourtt, O. Bouledroua, A.Khelil, M.Hadj milaini
University of chlef , Algeria
- Post: 34 **THERMAL AND DYNAMIC CHARACTERIZATION OF A TURBULENT SWIRLING JET IMPACTING PLATE PLANNE (EXPERIMENTAL AND NUMERICAL STUDY)**
A. Zerrouf, A. Khelil , L. Loukarfi
University of Chlef, Algeria
- Post: 35 **Simulation of Shunt active power filter controlled by SVPWM connected to a photovoltaic generator**
Omar.Maarouf, Ismail Bouyakoub, Benyounes Mazari
Université Hassiba ben bou ali de Chlef
- Post: 36 **Numerical Simulation of Dynamics Flows of Diffusion Flames in the Combustion Chamber**
S. Nechada*, A. Khelila, L. Loukarfia, M. Bouketitaa, A. Benniaa, Y. Bouhamidia
University Hassiba Benbouali, Chlef, Algeria
- Post: 37 **A Numerical Study of Building Configuration Impact on Airflow and Dispersion Processes of Traffic Emissions in Urban Street Canyons with Tree Planting**
Lakhdar BOUARBI, Bouabdellah ABED, Mohamed BOUZIT
University of sciences and technology of Oran (USTO), Oran, Algeria
- Post: 38 **EFFECT OF THE TYPE OF THE TURBINE IN AN AGITATED TANK**
M. Foukrach, M. Bouzit, Y. Kamla, H.Ameur
University Oran Algérie.

16:50 – 17:00		Selected the Best Poster Topic C
17:00–17:30	Exhibition in Chlef city	
19:00–20:00	Meeting Cooperation	
20:00-22:00	Lunch- Hotel La Vallée	

BEHAVIOUR OF 9%Cr STEEL AND SIMULATED HAZ AT 600°C

Ljubica MILOVIĆ*, Bojana ALEKSIĆ**, Abubakr M Hemer**, Vujadin Aleksić***

* University of Belgrade, Faculty of Technology and Metallurgy, Belgrade, Serbia

** Innovation Centre of the Faculty of Technology and Metallurgy, Belgrade, Serbia

*** Institute for testing of materials-IMS Institute, Belgrade, Serbia

Abstract: An investigation has been carried out into the behaviour of type IV cracks region in heat affected zone (HAZ) of P91 steel at 600°C. Microstructure zones where type IV failures may occur have been studied in details. Results are reported on the simulated specimens 11x11x70 mm tested at room and at operating temperature. The results of comparison of mechanical characteristics and microstructure have been analysed using two types of specimens: with post weld heat treatment (PWHT) and without PWHT. It has been found the presence of precipitates at the grain boundaries in simulated type IV zone of HAZ exposed to subsequent PWHT. It is further confirmed that the post weld heat treatment is necessary for 9%Cr (P91) steel.

Keywords: P91, Simulated HAZ, ICHAZ, PWHT.