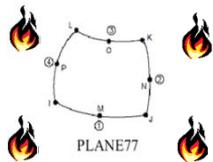
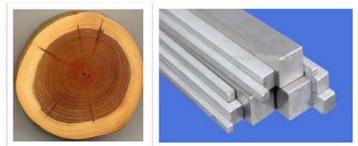


4th International Conference on INTEGRITY, RELIABILITY & FAILURE, Funchal, 23 - 27 June 2013**KEYWORDS**

- Wood-steel. Hybrid construction. Fire. Numerical model.

**1- INTRODUCTION**

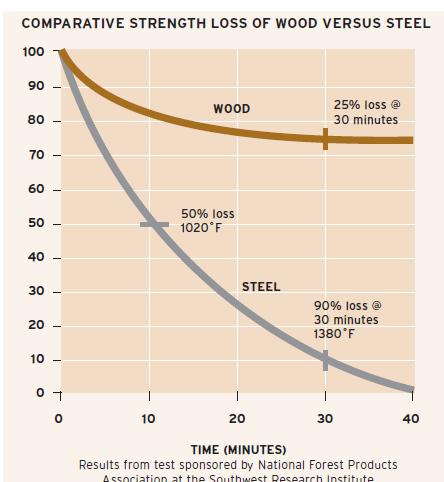
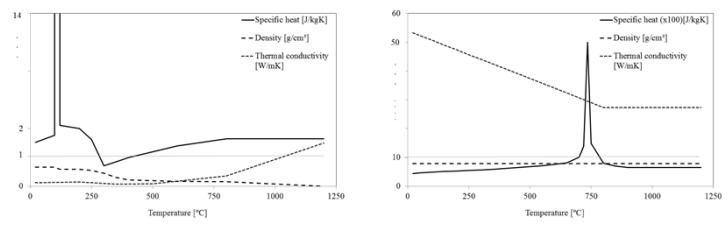
- The use of hybrid materials could increase the structural integrity of the construction elements.
- Steel material has many advantages over wood elements, strength, stability, resistance to woodworm, among others.
- Steel is incombustible and most of the times it can full recover strength after fire but, steel material conducts heat extremely well.
- Wood is a renewable resource, recently attracted by public attention.
- Wood is a natural material with good structural characteristics.
- The wood when exposed to accidental actions, such as fire conditions, has a surrounding charring depth.
- However, this layer can delay the heating process to the core section, acting as an insulating.

2- APPLICATIONS

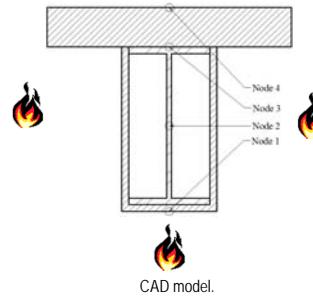
Wood-steel applications.

3- OBJECTIVE AND WHY WOOD-STEEL MATERIAL?

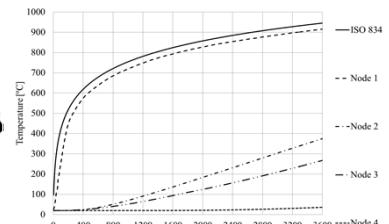
- The main objective of this work is to provide the thermal analysis in wood-steel hybrid elements for building constructions under fire conditions.
- The use of wood-steel hybrid models has major advantages as increased fire resistance, improved high strength, leads to economic and ecologic benefits.
- The numerical modelling of these hybrid models, providing the analysis at high temperatures, is complicated due to the heat produced, to form a layer of carbonization surrounding the wood, and also the properties of both materials are nonlinear.
- The complexity of this analysis needs some numerical techniques with high performance, which is the case of the finite element analysis.
- Hybrid wood/steel material is used for new building projects, bridges, slabs, etc.

**4- MATERIAL PROPERTIES**

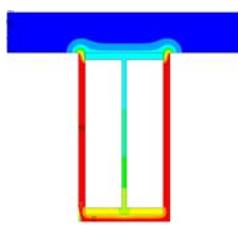
Wood and steel thermal properties.

5- WOOD-STEEL HYBRID PROFILE AND FIRE SCENARIO

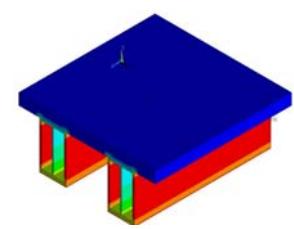
CAD model.



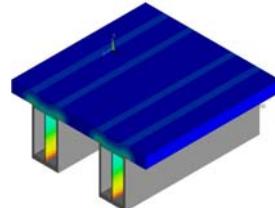
Time history, 0 to 3600s.



2D numerical analysis.



3D numerical analysis.



Charring layer of wood: 20°C-300°C.

- When wood material is externally applied to the steel profile, plays an important role as insulation, reducing the temperature inside steel.
- Wood has a good fire resistance even for three sides exposure, showing the ability to protect the steel.

6- CONCLUSIONS

- Unprotected steel elements under fire condition may suffer serious damage.
- The use of hybrid wood/steel elements could increase both structural strength and stiffness.
- Wood could be considered as an insulating material, the core section could remain at low temperature, function of fire exposure time and element cross section size.

REFERENCES

- EN 1995-1-2:2004. Eurocode 5: Design of timber structures, Part 1-2: General-Structural fire design, CEN, 2004.
- EN 1993-1-2:1995. Eurocode 3: Design of Structures - Part 1-2: General Rules - Structural Fire Design, CEN, 1995.
- EN 1991-1-2:2002. Eurocode 1: Actions on Structures - Part 1-2: General actions - Actions on Structures Exposed to Fire, CEN, 2002.

IRF2013 PROGRAM

SUNDAY, 23 JUNE 2013

SUN, 14:00 - 18:30

EARLY-BIRD REGISTRATION

Lounge

**Early-Bird Registration
and
Welcome Drink**

MONDAY, 24 JUNE 2013

MON, 09:00 - 09:30

OPENING SESSION

Main A.

**Welcome to Participants
(Conference Co-Chairs)
Welcome Address**

(President of Regional Government / Dean of FEUP / Dean of U. Madeira)

MON, 09:30 - 10:15

PLENARY LECTURE I

Main A.

DYNAMIC CONTACT IN CONTINUA USING VARIATIONAL INEQUALITIES

Professor Shaker A. Meguid

(University of Toronto, Canada)

Chair: Professor J.F. Silva Gomes (FEUP, Portugal)

MON, 10:15 - 11:00

PLENARY LECTURE II

Main A.

RECENT DEVELOPMENTS ON MPM AND ITS APPLICATION IN IMPACT AND EXPLOSION SIMULATION

Professor Xiong Zhang

(Tsinghua University, P. R. China)

Chair: Professor Mário A.P. Vaz (FEUP, Portugal)

MON, 11:00 - 11:30

COFFEE-BREAK

Lounge

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Chair:	Xiong Zhang (Tsinghua University, China)		
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3895	PARAMETRIC EXCITATION OF PLATES WITH CUTOUTS. A.K.L. Srivastava.		17
3913	GAS TURBINE HEALTH CLASSIFICATION USING A HYBRIDIZED OPTIMIZATION ALGORITHM. Mike J.W. Riley, Michael Gallimore, Chris Bingham, Jill Stewart.		19
4512	VIBRATION MODAL ANALYSIS OF ROLLING ELEMENT BEARING. Elsayed S. Elsayed, Ahmed Elkhateeb, Mostafa Yakout.		21

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Chair:	Carmine Pappalettere (Politecnico di Bari, Italy)		
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3879	INVESTIGATION OF THE GRANULAR SULPHUR FLOW-ABILITY TO MODIFY THE DESIGN OF GRANULATION UNIT. Roya Moradifar, Mohammad H. Kadivar, Eshagh Saharkhiz.		57
3912	INITIAL ATTEMPTS TO ENHANCING RUBBER SEALS QUALITY AND RELIABILITY. Achim Frick, Nouran Kaoud, Andrea Tomp.		59
3938	CHARACTERIZATION OF ALUMINIUM ALLOY CAPACITOR DISCHARGE JOINTS USING NON DESTRUCTIVE AND MECHANICAL TESTING. A.P. Carofalo, V. Dattoma, F. Palano, F.W. Panella.		61
3954	DEVELOPMENT ON MEASUREMENT TECHNOLOGY OF AXIAL LOAD IN TRUSS STRUCTURE MEMBER BY IMPACT SOUND. Tsutomu Yoshida, Mohd Z.B. Ismail, Takeshi Watanabe.		63

MON, 11:30-13:00		SESSION 1C	Room C
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3908	INFLUENCE OF SHOT PEENING ON THE FATIGUE RESISTANCE OF ALUMINUM ALLOY AA 7175-T74. Thiago A. Minto, Midori Y. Pitanga, Maria Odila H. Cioffi, Maria Cindra Fonseca, Herman J.C. Voorwald.		111
4008	EVALUATION OF SHOT PEENING ON THE FATIGUE STRENGTH OF CUSTOM 465 STAINLESS STEEL FOR AERONAUTIC APPLICATION. Rafael G. Bonora, Herman J.C. Voorwald, Maria Odila H. Cioffi.		113
4629	EFFECT OF PROCESSING PARAMETERS ON THE SURFACE INTEGRITY OF THE 316 L STAINLESS STEEL TREATED BY SURFACE MECHANICAL ATTRITION TREATMENT (SMAT). T. Grosdidier, Y.A. Samih, B. Beaussir, N. Alain-Bonasso, B. Bolle.		121
4784	DRY SLIDING WEAR BEHAVIOR OF CRYOGENIC TREATED GEARS MANUFACTURED BY POWDER METALLURGY. Vahid Abouei Mehrizi, Mohammad Talafi Noghani, Nassim Sharafi, Amin Moradi.		123

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3946	INFLUENCE OF MASONRY INFILL WALLS OVER RESISTANT CAPACITY OF BUILDINGS. Lucía Sánchez, Gracia L. Ramón Álvarez.	131
4103	FRACTURE ASSESSMENT AND RELIABILITY ANALYSIS OF CAST IRON WATER PIPE. Ni Yanling, Chun Qing Li.	133
4165	ULTRA-HIGH PERFORMANCE PLASTER (UHPP) FOR SEISMIC REINFORCEMENT OF MASONRY WALLS. João A. Guerreiro, João G. Ferreira, António S. Gago.	135
4042	NUMERICAL MODELLING AND EXPERIMENTAL CHARACTERIZATION OF POMBALINO "FRONTAL" WALL CYCLIC BEHAVIOR. Ana Maria Gonçalves, João G. Ferreira, Luis Guerreiro, Fernando Branco.	619

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3874	LASER EXCITATION AND DETECTION OF 1D WEDGE WAVES AND THEIR APPLICATIONS IN SENSORS AND ACTUATORS. Peter Hess, Alexey M. Lomonosov.		173
3943	HEAT TRANSFER IN CUTTING TOOL DURING MACHINING LIKE MILLING. THEORY AND EQUIVALENT THERMAL CIRCUIT. Farida Benabid, Hocine Benmoussa, Mohamed Arrouf, Mekki Assas.		177
4694	TECHNICAL NOTE: A PROPOSAL FOR THE AUTOMATIC DETECTION OF FAILURES IN THE AIRCRAFT INSTRUMENTATION WITHOUT SENSOR DUPLICATION. J. Barahona Fonseca.		179

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4699	RECYCLED WOODEN RAILROAD TIES. Edgar V.M. Carrasco, Leonardo B. Passos, Judy N.R. Mantilla.		641
4524	DIMENSIONAL STABILITY OF WOOD IN PRESENCE OF WATER. Débora Ferreira, Cristina Pinto, Paula Borges, Elza M.M. Fonseca.		643
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3964	STRESS REDISTRIBUTIONS PROVOKED BY THE USE OF EXPANSIVE SYSTEMS IN TIMBER STRUCTURES. Jose G. Fueyo, Manuel Dominguez, Jose A. Cabezas.		647
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4062	A FRAMEWORK FOR INTERACTING WITH ARTIFICIAL SYSTEMS. Peer M. Sathikh, S.G. Lee.		197
3863	THE INFLUENCE OF CONTOURING ON THE TENSILE STRENGTH OF FUSED DEPOSITION MODELLING PROCESSED PARTS. Dario Croccolo, Massimiliano De Agostinis, Giorgio Olmi.		199
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3995	INFLUENCE OF SINTERING TEMPERATURE ON THE STRUCTURAL AND DIELECTRIC PROPERTIES OF BST OBTAINED BY COLLOIDAL PROCESSING. P. V. Antunes, Susana Olhero, Ajay Kaushal, Jorge Lino, J.M.F. Ferreira.		207

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3922	BUCKLING AND POST-BUCKLING ANALYSIS OF THIN-WALLED STRUCTURES BASED ON LARGE ROTATION FIRST-ORDER SHEAR DEFORMATION THEORY. S. Q. Zhang, R. Schmidt.	29
4000	RADIAL ACOUSTIC OSCILLATIONS OF HOLLOW ANISOTROPIC SPHERICAL SHELL SUBMERGED IN LIQUID. Valery A. Polyakov.	33
4019	ANALYTICAL AND NUMERICAL SOLUTION FOR EXPANDABLE TUBULAR. Abdullah M. Al Shabibi, Jamil Abdo.	35
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Chairs: Hernani Lopes (IPB, Portugal), João Ribeiro (IPB, Portugal)			
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4669	A FLEXIBLE SINGLE IMAGE TECHNIQUE FOR RESOLUTION ENHANCEMENT OF THE FOURIER TRANSFORM FRINGE ANALYSIS METHOD. Paulo J. Tavares, Mário A.P. Vaz, J.F. Silva Gomes.	455	
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Symp_19 OCCUPATIONAL SAFETY AND HEALTH			
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Chair: Helena Navas (FCT/UNL, Portugal)			
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4734	GENERATING VALUE WITH TQM AND SIX SIGMA. J. Carlos Sá, José Oliveira.	759	
4745	THE DMAIC CYCLE APPLIED TO PROJECT MANAGEMENT. Luís Carneiro Pinto, Alexandra Tenera.	763	

4748	THE IMPORTANCE OF THE PUBLICATION OF THE FIRST EDITION OF THE PORTUGUESE-BRAZILIAN VIM 2012. Edivaldo A. Bulba, Helena V.G. Navas.	765
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3963	MATHEMATICAL MODELING OF A HIGH-SPEED DEFORMATION OF A VISCOPLASTIC PLATE. Volodymyr Hutsaylyuk, Heorhiy Sulym, Iaroslav Pasternak, Igor Turchyn.	31	
4664	DEVELOPMENT OF AN EXCEL-BASED CALCULATION TOOL FOR INTERACTION CURVES OF RECTANGULAR CONCRETE COLUMNS SUBJECTED TO FIRE. L. J. Wang, R. Caspeele, L. Taerwe.	49	
3987	PHASE MORPHOLOGY AND TOUGHNESS RESEARCH OF TWO STEELS USED FOR PIPELINE AND VESSEL INDUSTRY AFTER INTERCRITICAL HEAT TREATMENT. Xiaochen Song, Valdir A. Guimarães.	67	
3996	DESIGN OF A SYSTEM FOR FUEL ELEMENTS CLADDING INSPECTION OF A NUCLEAR RESEARCH REACTOR. Rogerio R. Rodrigues, Amir Z. Mesquita.	69	
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4647	ULTRASOUND METHODOLOGIES FOR DEFECTS DETECTION AND STRUCTURAL INTEGRITY VALIDATION OF FSW JOINTS. Jaime Santos, Mário Santos, Ana C.F. Silva, Daniel F.O. Braga, Pedro M.G.P. Moreira.	89	
3932	COATINGS SUPPORTED ON FECRALLOY: LINKS BETWEEN SURFACE TREATMENT, PARTICLE SIZE & COATING PROPERTIES. Stephen Adegbite.	115	
3939	EFFECT A WEAK MAGNETIQUE FIELD AND IMPOSED POTENTIAL ON CORROSION BEHAVIOR OF ALUMINIUM WIRE (AA1370). Rabeh Slimani, Nacer Zazi, Ali Bilek, J.P. Chopart.	117	
4052	THE DIFFERENCE BETWEEN CORROSION BEHAVIORS OF PERPENDICULAR ROLLING SURFACE AND THE ROLLING SURFACE AFTER HOMOGENISATION ANNEALING OF AA5083-H321 ALLOY. Nacer Zazi, J.P. Chopart, Ali Bilek.	119	
4749	ZINC OXIDE THIN FILMS DEPOSITED BY SPRAY PYROLYSIS TECHNIQUE : EFFECT OF THE SUBSTRATE TEMPERATURE ON THE PHYSICAL PROPERTIES. T. Mahdaoui, A.R. Madjoubi, C. Bousbaa, N. Bouaouadja, J.M. Alabella.	125	
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3989	OPTIMAL PIEZOELECTRIC ACTUATION IN COMPOSITE STRUCTURES. Aleksander Muc, Piotr Kędziora.	201	
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COCKTAIL RECEPTION by courtesy of IVBAM Institute of Madeira Wine			

TUESDAY, 25 JUNE 2013

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3980	COMPOSITE MANUFACTURING OF NATURAL RUBBER AMAZON - ANALYSIS OF MECHANICAL RESISTANCE AND ABRASION RESISTANCE. Edilaine Garcia, Maria José Geraldes.		255
4714	EFFECT OF PET FUNCTIONALIZATION IN COMPOSITES BASED ON TIRE RUBBER AND PLASTIC MATERIALS. Cristina Cazan, Mihaela Cosnita, Anca Duta.		259
4668	AMPLITUDE AND TIME SHIFT MEASUREMENTS FOR DAMAGE CHARACTERIZATION IN FIBERGLASS COMPOSITES USING PZT SENSORS. Mário Santos, Jaime Santos, Ana Amaro.		279
4717	FINITE ELEMENT PREDICTION OF MECHANICAL BEHAVIOUR UNDER BENDING OF HONEYCOMB SANDWICH PANELS. Sid-Ali Kaoua, Krimo Azouaoui.		287
3877	DIELECTRIC ANALYSIS OF INTEGRITY IN POLYPROPYLENE - NANOCARBON COMPOSITES. Vitaliy G. Shevchenko, Sergey V. Polschikov, Polina M. Nedorezova, Alla N. Klyamkina, Alexander M. Aladyshev, Anatoliy T. Ponomarenko.		303
3921	MEASUREMENT OF ENERGY LOSS COEFFICIENT OF ELECTROSTATICALLY ACTUATED MEMS RESONATORS. Marius Pustan, Cristian Dutescu, Corina Birleanu.		305
3991	HYBRID CARBON-POLYMER COMPOSITES FOR MEDICAL APPLICATIONS. Romeo Ciobanu, Cristina Schreiner, Gabriel Dimofte, Thomas Schreiner.		309
4058	CNT AGGLOMERATES SIZE AND DISTRIBUTION INFLUENCE ON ALUMINUM COMPOSITES STRENGTH. O. Carvalho, G. Miranda, D. Soares, F.S. Silva.		317
4073	HARMONIC OSCILLATIONS OF NANOSIZE PIEZOELECTRIC BODIES WITH SURFACE EFFECTS. Andrey V. Nasedkin, Victor A. Eremeyev.		319
4663	ELASTOPLASTIC MODELLING OF DAMAGE IN POLYMER-CLAY NANOCOMPOSITES WITH EVOLUTIONARY PARTICLE DEBONDING. Ammar Mesbah, Fahmi Zaïri, Moussa Naït-Abdelaziz, Jean-Michel Gloaguen, Krimo Azouaoui.		321
3867	CHARACTERIZATION OF THE KINEMATICS RESPONSE AND ELECTROMIOGRAPHIC DYNAMICS OF WALKING AND RUNNING SHOES WITH DIFFERENT LEVELS OF WEAR. Alberto Graziano.		333
3870	CORRELATION STUDY BETWEEN THE EXPLOSIVE FORCE OF THE LOWER LIMBS AND THE KINEMATIC PARAMETERS DURING THE SUSPENDED LAUNCH IN BASKETBALL. Anicencio Fabião, Alberto Graziano.		335
3985	MUSCLE ACTIVATION AND THREE-DIMENSIONAL KINEMATICS OF UPPER EXTREMITY IN ARMWRESTLING. Lin-Hwa Wang, Meng-Kai Hong, Kuo-Cheng Lo Lo, Hong-Wen Wu.		337
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4072	ANALYSIS OF MANIPULATION FUNCTION OF PATIENTS WITH UPPER LIMB DISORDERS. Agata Guzik-Kopyto, Robert Michnik, Jacek Jurkojć, Piotr Wodarski, Wiesław Rycerski, Marcin Streiss.		345
4619	BIOMECHANICAL ANALYSIS OF SURGICAL TREATMENT OF THE CERVICAL SPINE – ARTHRODESIS. Diana Gavazzo, António Completo, Abel Nascimento.		347
4312	BIOMECHANICAL ANALYSIS OF INTRINSIC PARAMETERS IN KNEE CARTILAGE. António Completo, Joana Pereira, António Ramos, Carlos Relvas, José Simões.		353
4009	MULTIDOF WIRELESS SENSOR SYSTEM BASED ON IMU-MEMS TECHNOLOGY SUPPORTED BY ENERGY HARVESTING METHODS. Jerzy Kaleta, Krzysztof Kot, Monika Rikitatt, Przemysław Wiewiórski.		359
4010	RAPID DEMAGNETIZATION OF NEODYMIUM MAGNETS, DUE TO MECHANICAL SHOCK, AS A PULSE POWER SUPPLY FOR MICROPROCESSOR SYSTEM. Jerzy Kaleta, Przemysław Wiewiórski.		361

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4769	NUMERICAL STUDY OF THE BALLISTIC RESISTANCE OF THE ARAMID FABRIC LAYERS. Piotr Kedzierski, Andrzej Morka, Tadeusz Niezgoda.	379
3860	A SELECTION SYSTEM OF BRAZILIAN NUCLEAR SITES BASED ON EPRI SITING GUIDE MODEL USING FUZZY LOGIC: AN EXPLORATORY EXERCISE IN RELIABILITY ENGINEERING. Carlos Frederico Barros, Drausio Lima Atalla, Carlos A. N. Cosenza.	385
4024	STAMPING OF ADVANCED HIGH STRENGTH STEEL: COMPARATIVE STUDY OF STEELS FE E340, FE 600DP AND FE 800DP. Gilmar C. Silva, Henrique C. Amaral, José R.C. Carneiro, Tarcísio J. Almeida.	399

TUE, 09:30 - 10:15	PLENARY LECTURE III	A-101
DESIGN FOR RELIABILITY AND MAINTAINABILITY Professor E.A. Elsayed (Rutgers University, USA) Chair: Professor Sergei T. Mileiko (Russian Academy of Sciences, Russia)		

TUE, 10:15 - 11:00	PLENARY LECTURE IV	A-101
ULTRA LOW FRICTION OF AMORPHOUS CARBON NITRIDE WITH CONTROLLING NANO SURFACE STRUCTURE Professor Noritsugu Umehara (Nagoya University, Japan) Chair: Professor Shaker A. Meguid (University of Toronto, Canada)		

TUE, 11:00 - 11:30	COFFEE-BREAK	Lounge

TUE, 11:30-13:00	SESSION 4A	Room A
Topic_H: MODES OF FAILURE Chair: Pedro Moreira (INEGI, Portugal)		
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3926	FULL RANGE FATIGUE LIFE ESTIMATION METHOD USING CRITICAL DISTANCE STRESS THEORY. Muhammad A.B. Wahab, Toshio Hattori, Minoru Yamashita.	217
3929	TRUNK MAINS FAILURES: THE EFFECT OF CORROSION ON RESIDUAL PIPE STRENGTH. Stephen Adegbite, Azadeh Fahimi, Tim Evans, Jeff Farrow, David Jesson, Mike Mulheron, Paul Smith.	219
3944	THE INFLUENCE OF LOCALISED PIT DISTRIBUTION ON THE ULTIMATE STRENGTH OF SHIP STRUCTURAL MEMBERS. Y. Wang, J.A. Wharton, R.A. Shenoi.	221

TUE, 11:30-13:00	SESSION 4B	Room B
Topic_B: TESTING AND DIAGNOSTICS Chair: Hernani Lopes (IPB, Portugal)		
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4666	MECHANICAL BEHAVIOR OF AI-VIIIB-IVA TRYMETALLIC ALLOY. S. Valdez, S.R. Casolco, R.A. Rodríguez-D..	97
4672	AN AUTOMATED METHOD FOR THE MEASUREMENT OF FATIGUE CRACKS PROGRESSION. Paulo J. Tavares, Pedro M.G.P. Moreira.	99
4742	MECHANICAL BEHAVIOUR OF POLYETHYLENE FOAM SANDWICH PANELS UNDER COMPRESSION LOADING. Antonio Boccaccio, Caterina Casavola, Luciano Lamberti, Carmine Pappalettere.	101

4758	UTILIZING RFM AND CONDITION MONITORING TO ENHANCING PROCESS SAFETY. Soliman A. Mahmoud.	103
4713	SIF DETERMINATION USING IMAGE PROCESSING TECHNIQUES. Paulo J. Tavares, Pedro M.G.P. Moreira.	105

TUE, 11:30-13:00		SESSION 4C	Room C
Topic_I: COMPOSITE MATERIALS			
Chair: Dario Croccolo (<i>U. Bolonha, Italy</i>)			
REF:	Title and Author(s):		Page:
4022	PROPOSED ABOUT USE OF RECYCLED MATERIAL IN A AUTOMOTIVE COMPONENT EXTERNAL WHEEL BOX. Gilmar C. Silva, Fabíola P. Lozada, José R.G. Carneiro.		261
4075	PROCESSING AND MECHANICAL EVALUATION OF ALUMINIUM COMPOSITES REINFORCED WITH CARBON NANOTUBES. O. Carvalho, G. Miranda, D. Soares, F.S. Silva.		265
4077	ELASTIC AND INELASTIC PROPERTIES OF METAL-PORCELAIN COMPOSITES APPLIED TO FUNCTIONALLY GRADED METAL-CERAMIC DENTAL RESTORATIONS. Bruno Henriques, Delfim Soares, Filipe Silva.		267
4097	BEHAVIOUR AND ANALYSIS OF CONCRETE BEAMS REINFORCED BY CFRP RODS. Khaled Heiza.		269

TUE, 11:30-13:00		SESSION 4D	Room D
Symp_14: ASSESSMENT, MONITORING AND CONTROL OF CIVIL ENGINEERING STRUCTURES			
Chairs: Álvaro Cunha (<i>FEUP, Portugal</i>), Elsa Caetano (<i>FEUP, Portugal</i>)			
REF:	Title and Author(s):		Page:
4093	ASSESSMENT OF A MULTIPLE-SPAN BRIDGE BY NUMERICAL MODELLING AND IN-SITU MONITORING. Xinghua Chen, Piotr Omenzetter, Sherif Beskyroun.		601
4111	IMPLEMENTATION AND MONITORING OF A PASSIVE CONTROL SYSTEM IN A LIVELY FOOTBRIDGE. Elsa Caetano, Carlos C. Moutinho, Álvaro Cunha.		581
4003	A SIMPLE AND RAPID APPROACH TO POST-EARTHQUAKE ASSESSMENT OF BRIDGE CONDITION AND DAMAGE. Shahab Ramhormozian, Piotr Omenzetter.		583
4074	ASSESSMENT OF THE STRUCTURAL BEHAVIOUR OF A REHABILITATED IRON PLATFORM ("EL CABLE INGLES") BY THE APPLICATION OF OPERATIONAL MODAL ANALYSIS AND MODEL UPDATING. Javier F.J. Alonso, Andres Sáez Pérez.		585
3988	NON-DESTRUCTIVE CHARACTERIZATION AND DYNAMIC IDENTIFICATION OF AN HISTORICAL BELL TOWER. Angelo S. Carone, Dora Foti, Nicola I. Giannoccaro, Riccardo Nobile.		587

TUE, 11:30-13:00		SESSION 4E	Room E
Topic_K: BIOMECHANICAL APPLICATIONS			
Chair: Mario Vaz (<i>FEUP, Portugal</i>)			
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3992	A MECHANICAL ANALYSIS OF BIODEGRADABLE NANOCOMPOSITES FOR ACL REPLACEMENT MEDICAL DEVICE. Viviana C. Pinto, José Xavier, Artur Pinto, Fernão D. Magalhães, Rui M. Guedes.		329
4040	AN APPROACH ON ARTHRITICS HIP SURFACE RESHAOING USING FINITE ELEMENT METHOD. Wei Li, Sarah Wayte, Damian Griffin, Derek Chetwynd, Ken Mao.		331
4635	BIOMODELLING CERVICAL SPONDYLOTIC MYELOPATHY: EVALUATION AND SURGICAL PLANNING. Luís Queijo, João Rocha, Paulo Miguel Pereira.		349

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Symp_28 FIRE AND STRUCTURAL ENGINEERING			
Chairs: Paulo Piloto (<i>IPB, Portugal</i>), Alberto Meda (<i>U. Rome, Italy</i>)			
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3890	FIRE ANALYSIS OF REINFORCED CONCRETE TUNNEL LINING. Giovanna Lilliu, Alberto Meda.		741
3953	QUANTITATIVE EVALUATION OF FIRE SAFETY FACTORS INFLUENCE FOR BUILDINGS USING COGNITIVE MAPS AND ANP APPROACH. Grzegorz Ginda, Mariusz Maślak.		743

4041	FIRE BEHAVIOUR OF COMPOSITE STEEL TRUSS AND CONCRETE BEAM. Paulo A.G. Piloto, Sérgio P.P.A. Roque, Paulo M.M. Vila Real, Giovanni A. Plizzari.	745
4693	FIRE RESISTANCE TEST AND THE CRITICALNESS OF CONCRETE SPALLING REGARDING SAFETY. Alexander Korten, Volker Wetzig.	747
4729	EXPERIMENTAL ANALYSIS OF REVERSE CHANNEL JOINT COMPONENT AT ELEVATED TEMPERATURES. Pedro Barata, Aldina Santiago, João P. Rodrigues.	749

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Topic_M: IMPACT AND CRASHWORTHINESS			
Chair: José Cirne (U. Coimbra, Portugal)			
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4026	CRASHWORTHINESS OF HYBRID STRUCTURES. Thomas Tröster, Christian Lauter, Corin Reuter.		373
4334	PRESTRESS EFFECT ON THE BALLISTIC BAHAVIOR OF CERAMIC ARMOR. Ahmad Serjouei, Runqiang Chi, Idapalapati Sridhar, Tan B. Eng Geoffrey.		375

TUE, 13:00 - 14:00		LUNCH	REST

TUE, 14:00-15:30		SESSION 5A	Room A
Topic_H: MODES OF FAILURE			
Chair: Paraskevas Papanikos (U. Aegean, Greece)			
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3982	INFLUENCE OF ANODIZING TREATMENT ON FATIGUE RESISTANCE OF Ti-6Al-4V TITANIUM ALLOYS. Eric Vermesse, Catherine Mabru, Laurent Arurault.		225
3983	EFFECT OF LUBRICITY OF DRILLING FLUIDS ON BUCKLING OF COILED TUBING IN DRILLING OPERATIONS. Danish Haneef, Jamil Abdo, Abdullah Al-Shabibi.		227
3986	INFLUENCE OF PRE-COMBINED LOADING ON MECHANICAL PROPERTIES AND FRACTURE MECHANISM OF ALUMINUM ALLOY 2024-T3. Volodymyr Hutsaylyuk, Mykola Chausov, Lucjan Śnieżek, Tomasz Słęzak, Andrii Pylypenko, Valentin Berezin.		229
4064	DESIGN FOR ROBUSTNESS OF MULTI-STORY REINFORCED CONCRETE FRAME STRUCTURES UNDER EXTREME LOADS. Ioan Petran, Mihai Senila.		231

TUE, 14:00-15:30		SESSION 5B	Room B
Topic_J: NANOTECHNOLOGIES AND NANOMATERIALS			
Chair: Shaker A. Meguid (U. Toronto, Canada)			
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3984	HIGH TEMPERATURE AND HIGH PRESSURE NANOCLAY MODIFIED DRILLING FLUIDS. Jamil Abdo, Danish Haneef, Abdullah Al-Shabibi.		307
4032	MODELLING OF BUCKLING OF SINGLE-WALLED CARBON NANOTUBES BASED ON COSSERAT SURFACE THEORY. Yu Zhang, Carlo Sansour, Chris Bingham.		315
4719	POLYVINYL ALCOHOL – CARBON NANOTUBE FIBERS RESPONSE UNDER PROGRESSIVE DAMAGE ACCUMULATION TENSILE TESTS. Stavros K. Kourkoulis, Nikolaos D. Alexopoulos.		323

TUE, 14:00-15:30		SESSION 5C	Room C
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Chair:	Achim Frick (<i>Hochschule Aalen, Germany</i>)		
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4638	IMPACT DAMAGE MONITORING IN CFRP LAMINATES USING ULTRASONIC AND IR THERMOGRAPHY. D.P. Myriounis, T. Barron.		273
4639	WEAR BEHAVIOUR OF ALUMINIUM BASED MMC USED IN BRAKE DISCS. D.P. Myriounis, S.T. Hasan.		275
4662	MECHANICAL ANALYSIS OF NATURAL JUTE FIBRES AND POSSIBLE APPLICATION OF THERMOSETTING RESIN COMPOSITES. João Rocha, Luís Queijo.		277
4709	APPLICATION OF NOVEL COMPOSITE ALLOY FOR IMPROVING RELIABILITY, DURABILITY AND FUNCTIONAL PROPERTIES OF COMBUSTION ENGINE. Antoni Jankowski, Zbigniew Smalko, Jozef Zurek, Zenon Sławinski.		283
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Chairs:	Elsa Caetano (<i>FEUP, Portugal</i>), Álvaro Cunha (<i>FEUP, Portugal</i>)		
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4047	SEISMIC VULNERABILITY OF STRATEGIC BUILDINGS IN ORAN (ALGERIA). Ramdane Kheir-Eddine, Senouci Abbas, Mammar Lahouari.		591
3925	COMPARATIVE LINEAR AND NON-LINEAR TIME-HISTORY ANALYSIS OF AN EXPERIMENTAL PROTOTYPE STRUCTURE USING ADVANCED TECHNIQUES. Sebastian Crijanovschi, Gabriela M. Atanasiu.		593
4039	PASSIVE-DAMPING DESIGN FOR STRUCTURAL VIBRATION CONTROL: A VELOCITY-FEEDBACK ENERGY-TO-PEAK APPROACH. Francisco Palacios-Quiñonero, Josep M. Rossell, Josep Rubió-Massegú, Hamid R. Karimi.		595
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Chairs:	J.C. Reis Campos (<i>FMDUP, Portugal</i>), André Correia (<i>FMDUP, Portugal</i>)		
REF:	Title and Author(s):		Page:
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4066	OSSEointegration of DENTAL IMPLANTS IN rhBMP-2 INDUCED BONE AND STEM CELL-BASED INDUCED BONE: A HISTOLOGIC STUDY IN THE RABBIT PERI-IMPLANT DEFECT MODEL. Isabel Guerra, Helena Figueiral, Mário Vasconcelos, José R. Campos, Margarida Sampaio.		475
4697	INDIRECT REPAIR OF METAL-CERAMIC RESTORATIONS: THE BONDING ISSUE. Paulo A. Guimarães, Paulo J. Almeida, Francisco Góis, João S. Fernandes.		479
4653	PERI-IMPLANT BIOLOGICAL COMPLICATIONS AND OVERDENTURES. Margarida S. Fernandes, Paula Vaz, Patrícia Fonseca, José C. Reis Campos, Maria Helena Figueiral.		481
TUE, 14:00-15:30		SESSION 5F	Room F
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Chair:	Carlos C. António (<i>FEUP, Portugal</i>)		
REF:	Title and Author(s):		Page:
4106-IP	A CO-EVOLUTION APPROACH FOR RBDO OF COMPOSITE STRUCTURES UNDER DYNAMIC BEHAVIOR. Carlos C. António. (<i>Invited Paper</i>)		509
3896	REDUCED BASIS SURROGATE MODELLING APPROACH APPLIED TO THE IDENTIFICATION OF MECHANICAL PROPERTIES. Christian Gogu, Jean Charles Passieux.		511

3948	SHAPE OPTIMIZATION OF A LIGHTWEIGHT TETRAPOD ELEMENT USING CAD/CAE TOOLS AND METAMODELS. Alexander Janushevskis, Anatoly Melnikovs, Janis Janusevskis.	513
4117	ANN-MCS APPROACH FOR GLOBAL UNCERTAINTY ANALYSIS OF COMPOSITE STRUCTURES. Carlos C. António, Luísa N. Hoffbauer.	515

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Chair: César Vasques (<i>INEGI, Portugal</i>)			
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3951	A 3D VIBROACOUSTIC MODEL FOR THE PREDICTION OF UNDERWATER NOISE FROM OFFSHORE PILE DRIVING. Apostolos Tsouvalas, Andrei Metrikine.	539	
3981	COMBINING NEURAL NETWORKS FOR ONLINE DAMAGE DETECTION IN EULER-BERNOULLI BEAMS. Juliana Almeida, Hugo Alonso, Paula Rocha.	543	
4082	THE INFLUENCE OF TEMPERATURE FIELD ON VIBRATION OF NANO, MICRO AND MINI BEAMS. Jurij Avsec.	545	
4637	INVESTIGATION OF THE ADEQUACY OF THE ACOUSTIC FIELD MODEL IN THE CLOSED SPACE CAUSED BY SEVERAL SOURCES. Robertas Mikalauskas, Vitalijus Volkovas.	549	
4645	A STUDY OF THE IMPLICIT SECULAR EQUATION FOR RAYLEIGH WAVES IN 2D ORTHOTROPY. Jan Cerv, Jiri Plesek.	551	

TUE, 15:30 - 16:00		COFFEE-BREAK	Lounge

TUE, 16:00-17:30		SESSION 6A	Room A
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Chair: Volodymyr Hutsaylyuk (<i>Military University of Technology, Poland</i>)			
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4367	CORROSION STUDY OF SOME STAINLESS AND CARBON STEELS FOR STRUCTURAL APPLICATIONS. Rui A. Silva, Pedro R. Soares, António A. Crispim.	235	
4720	TENSILE MECHANICAL BEHAVIOUR OF AERONAUTICAL 2024 AND 2198 ALUMINUM ALLOYS AFTER CORROSION EXPOSURE. Zoi S. Metaxa, Nikolaos D. Alexopoulos, Paraskevas Papanikos, Constantinos Stergiou.	237	
4727	MAINTENANCE IN INDUSTRIAL EQUIPMENT: FAILURE INVESTIGATION IN A STAMPING PRESS THROUGH A RELIABILITY ANALYSIS. Luiz H. Sbardelotto, Jairo J.O. Andrade.	239	

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Symp_5: BLOOD FLOW MECHANICAL BEHAVIOUR			
Chairs: Catarina Castro (<i>U. Porto, Portugal</i>), Luisa Sousa (<i>U. Porto, Portugal</i>)			
REF:	Title and Author(s):	Page:	
3947-IP	BLOOD SIMULATION AND VIRTUAL BYPASS SURGERY. Catarina F. Castro, Carlos C. António, Luisa C. Sousa. (<i>Invited Paper</i>)	461	
3898	STENOSED CAROTID BIFURCATION: HEMODYNAMICS AND WALL SHEAR STRESS. Luísa Sousa, Catarina Castro, Carlos C. António, Fernando Sousa, Rosa Santos, Pedro Castro, Elsa Azevedo.	463	
4657	AUTOMATIC SEGMENTATION OF THE CAROTID ARTERY IN ULTRASOUND B-MODE IMAGES. André M.F. Santos, João M.R.S. Tavares, Elsa Azevedo, Luísa C. Sousa.	467	
4776	NUMERICAL STUDY OF BLOOD FLOW IN A BIFURCATION WITH A STENOSIS: PULSATILE FLOW AND ELASTICITY OF THE FLUID. S.I.S. Pinto, E. Doutel, J.B.L.M. Campos, J.M. Miranda	469	

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Chair:	Andrey Nasedkin (Southern Federal University, Russia)		
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4718	MECHANICAL BEHAVIOR OF A TUBULAR COMPOSITE STRUCTURE UNDER THE EFFECTS OF A COMBINED LOADING. Mansur Celebi, Halit S. Turkmen.		289
4721	FINITE ELEMENT MODELLING OF THE SHEAR STRESS DISTRIBUTION OF EMBEDDED POLYVINYL ALCOHOL – CARBON NANOTUBE FIBERS IN GLASS FIBER REINFORCED COMPOSITES. Paraskevas Papanikos, Ilias Tapeinos, Stavros K. Kourkoulis, Nikolaos D. Alexopoulos.		291
3935	MODELLING THE PULLOUT OF HOOKED STEEL FIBERS FROM CEMENTITIOUS MATRIX. Edmunds Zile, Olga Zile.		293
4071	STATIC AND DYNAMIC PROPERTIES OF HYBRID COMPOSITE BEAMS. Jiří Had, Milan Růžička, Pavel Steinbauer, O. Uher, Viktor Kulíšek.		297

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4754	RETROFIT OF RC COLUMNS CYCLICALLY LOADED IN BIAXIAL FLEXURE WITH AXIAL FORCE. J.P. Silva, P. Rocha, H. Rodrigues, N. Vila Pouca, A. Arêde.		613
4755	CODE BASED DESIGN PROCEDURE AND ITS IMPACT ON REAL CONSTRUCTION PRACTICES IN NEPAL. Hemchandra Chaulagain, Hugo Rodrigues, Enrico Spacone, Humberto Varum.		615
3959	SEISMIC CHARACTERIZATION OF TRADITIONAL TIMBER FRAME WALLS: EXPERIMENTAL RESULTS. Elisa Poletti, Graça Vasconcelos.		617
4100	DYNAMIC STRUCTURAL HEALTH MONITORING OF A CIVIL ENGINEERING STRUCTURE WITH A POF ACCELEROMETER. Paulo Antunes, João Dias, Humberto Varum, Paulo André.		137

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Chairs:	André Correia (FMDUP, Portugal), J.C. Reis Campos (FMDUP, Portugal)		
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4703	BIOMECHANIC LAWS APPLIED TO A FIXED DENTAL PROSTHESIS – HOW CAN THEY AFFECT THE REHABILITATION? A CLINICAL CASE. Francisco Góis, Pedro Fernandes, Paulo Almeida, José M. Rocha, André Correia, João S. Fernandes.		483
4065	DENTAL IMPLANT PROSTHODONTIC REHABILITATION AND IL-1 GENE POLYMORPHISMS. Paula Vaz, João Fernandes, Ana Braga, António Felino, Maria Tavares.		485
4043	RETROSPECTIVE EVALUATION OF THERAPEUTIC OUTCOMES OF FUNCTIONAL APPLIANCES COMBINED WITH HEADGEAR. Maria João Ponces, José P. Tavares, Eugénio Martins, Paula Vaz, Afonso Ferreira.		489
4305	TOOTH GERMS IN PRENATAL ULTRASOUND – ITS IDENTIFICATION IS POSSIBLE?. Mariana Seabra, Paula Vaz, Francisco Valente, Ana Braga, António Felino.		493

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Chair:	Carlos C. António (FEUP, Portugal)		
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4622	STIFFENER LAYOUT OPTIMIZATION OF THE OVERALL BUCKLING OF THIN-WALLED STIFFENED PLATE. Lianchun Long, Yang Li .	517
4012	ADDRESSING GEOMETRICAL NONLINEARITY CONSIDERING PROBABILISTIC MATERIAL NONLINEARITY. Iffat Siddique.	521
4659	APPLICATION OF ANALYTICAL TARGET CASCADING TO THE DESIGN OF A RAILWAY VEHICLE SUSPENSION SYSTEM. Dário Silva, Hugo Policarpo, Miguel M. Neves, Virgínia Infante.	519

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Chair: César Vasques (INEGI, Portugal)			
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4691	ON EFFECT OF MECHANICAL PROPERTIES OF POROUS MATERIALS ON THE TRANSFER OF ACOUSTIC VIBRATIONS. Elena Prokofieva, Mike Barker, Minsung Cho.	557	
4733	NEW VIBRODYNAMIC PHENOMENA RELATIVE TO THE SPECIFIC VOLUME FORMS OF LOOSE/GANULAR MATTER. Yuri Makov.	559	
4746	SOUND AND VIBRATION IN AN INTERDISCIPLINARY CONTEXT; SOME EXAMPLES FROM THE LAB. Jan Tro, Ulf Kristiansen.	561	
6001	SPACE QUALIFICATION OF AN ULTRA LOW-SHOCK NON-EXPLOSIVE ACTUATOR FOR HOLD-DOWN AND RELEASE MECHANISMS: INITIAL TESTS. O.M.F. Morais, C.M.A. Vasques, L.M.S. Guimarães, P.M.G. Salvado, C. Perestrelo, V. Pimenta, G. Baldesi.	NA	

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4687	REVIEW OF POSSIBILITY APPLICATION SHAPE MEMORY ALLOY IN KINETIC ENERGY RECOVERY SYSTEMS. Wojciech Klein, Arkadiusz Mężyk.	425	
4750	X-RAYS TOMOGRAPHIC RECONSTRUCTION IMAGES OF MATERIALS USING INVERSE PROBLEM RESOLUTION BASED ON SPARSE REGULARIZATION METHOD. Aicha Allag, Redouane Drai.	439	
4634	DISPLACEMENT AND STRAIN FIELDS ASSESSMENT OF PDMS USING DIGITAL IMAGE CORRELATION. Bebiana Mendonça, João Ribeiro, Hernani Lopes, Pedro Martins, Mário A.P. Vaz, J.F. Silva Gomes.	447	
4712	REAL-TIME DAMAGE IDENTIFICATION USING ROTATING FIELD ANALYSIS. Hernani Lopes, João Ribeiro, J.V. Araújo Santos, Mário A.P. Vaz, J.F. Silva Gomes.	451	
4654	ON THE MECHANICAL FAILURE OF ARTERIAL PROSTHESES. Catarina F. Castro, Carlos C. António, Luísa C. Sousa.	465	
4045	MOUTHGUARD FOR ORTHODONTIC PATIENT TRUMPET PLAYER. Maria João Ponces, Saúl Castro, Maria Cristina Pollmann, Paula Vaz, Jorge Dias Lopes.	487	
4014	CONE BEAM COMPUTED TOMOGRAPHY AND PROSTHODONTIC REHABILITATION OF CLEIDOCRANIAL DYSOSTOSIS. Paula Vaz, Maria Ponces, Inês Corte-Real, Afonso Ferreira, José R. Campos.	491	
4306	PRENATAL ULTRASOUND SCREENING, TOOTH GERMS HISTOLOGY AND HYPODONTIA. Mariana Seabra, António Felino, Francisco Valente, Rosete Nogueira, Paula Vaz.	495	
4682	INOVATIVE HYBRID JOINT TECHNIQUE THROUGH FRICTION STIR WELDING AND ADHESIVE BONDING. Daniel F.O. Braga, Ana Silva, Miguel A.V. Figueiredo, L.F.M. Silva, Pedro M.G.P. Moreira.	533	
4715	STUDY OF ALTERNATIVE MANUFACTURING PROCEDURES FOR AN ALUMINIUM RAILWAY CAR PASSENGER UNDERFRAME. João P.A. Dias, Daniel F.O. Braga, Sérgio M.O. Tavares, Pedro M.G.P. Moreira, Paulo M.S.T. Castro.	535	
3952	A PARAMETRIC STUDY ON THE INFLUENCE OF VARIOUS PARAMETERS ON THE UNDERWATER NOISE LEVELS GENERATED BY OFFSHORE PILE DRIVING. Gargi Kaushik, Apostolos Tsouvalas, Andrei Metrikine.	541	
4092	MECHANICAL CONTROL OF INELASTIC CHARACTERISTICS, DEFECT NANOSTRUCTURE CHANGING OF SiO ₂ + Si WAFER-PLATE, GeSi. A.P. Onanko, S.A. Vyzhva, Y.A. Onanko.	547	
4684	DYNAMIC RESPONSE OF LAYERED SATURATED SOIL SUBJECT TO SUBWAY TRAIN LOADS. Ding YuQin, Chen ChunLai, Gao ShuWei, Tao Rong.	555	

4751	DECONVOLUTION ALGORITHMS AND THEIR APPLICATIONS IN ULTRASONIC INSPECTION OF CFRP MATERIAL. Abdessalem Benammar, Redouane Drai.	563
3949	ASSESSMENT OF A FULL SCALE PEDESTRIAN BRIDGE BY MODEL UPDATING. Faisal Shabbir, Piotr Omenzetter .	579
4095	DYNAMIC IDENTIFICATION AND FINITE MODEL UPDATING OF TRANI CATHEDRAL'S BELL TOWER. M. Diaferio, Dora Foti, Nicola I. Giannoccaro, Francesco Tucci.	603
3958	EFFECT OF MASONRY INFILL WALLS ON THE SEISMIC BEHAVIOUR OF BUILDINGS DURING THE MAY 2011 LORCA EARTHQUAKE. Silvia R. Gutiérrez, José R.A. Arroyo, Peter P. Hoogendoorn, Ramón A. Cabal, Julio C. López-González.	609
4689	A NONLINEAR SOIL CONSTITUTIVE MODEL BASED ON HYPERBOLIC TANGENT FUNCTION. YuQin Ding, YongXing Zhang.	611

TUE, 19:00 - 23:00	BANQUET	Casino
CONFERENCE BANQUET Casino do Funchal (FUNCHAL)		
WEDNESDAY, 26 JUNE 2013		

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4771	MODULUS OF ELASTICITY OF CONCRETE PRODUCED WITH BASALTIC AGGREGATES. Lino Maia, Cátia Caetano, Miguel Correia, José Santos.	633
4651	MODEL FIRE OF TWO STOREY WOODEN - FRAME BUILDING. Linda Makovická Osvaldová, Anton Osvald, Martin Petko.	653
4102	A CONTRIBUTION TO ASSESS THE STRUCTURAL VULNERABILITY OF TRADITIONAL TIMBER PAVEMENTS. Marcos Teixeira, Débora Ferreira, Vitor Cunha, Artur Feio, José Lousada, Humberto Varum, João M. Guedes, Jorge Pinto.	655
4624	INFLUENCE OVER THE STRESSES OF THE SIZE AND POSITION OF THE PUNCHED METAL PLATES STRUCTURAL TIMBER JOINTS. Jose G. Fueyo, Jose A. Cabezas, Manuel Dominguez.	657
4090	THERMAL ANALYSIS OF WOOD-STEEL HYBRID CONSTRUCTION. Elza M.M. Fonseca, H.M.E. Ramos, H.J.G. Silva, Débora R.S.M. Ferreira.	659
4646	PROPOSAL OF A PATH TO SELECT A MATRICIAL METHOD FOR RISK ASSESSMENT. Cátia Ferreira, J. Santos Baptista.	669
4656	DEVELOPMENT AND MECHANICAL CHARACTERIZATION OF BIO-COMPOSITES FOR APPLICATION IN LIGHT-WEIGHT CONSTRUCTION. A. Alves, J. Velosa, S. Patinha, S. Rana, R. Fangueiro.	723
3924	A DSP SYSTEM APPLIED TO ELECTROMECHANICAL IMPEDANCE-BASED SHM ARCHITECTURE. Carlos A. Gallo, Antonio C. Oliveira Jr, Roberto M.F. Neto.	731
4736	PRACTICAL DETERMINATION OF A RELIABILITY TEST SCOPE. Zdenek Vintr.	761
4763	DIMENSIONAL CONTROL CASE STUDY IN A PUNCHING CELL. J.M. Herrera Olivenza, D. Rodríguez Salgado, I. Cambero Rivero, J. García Sanz-Calcedo.	767
4700	INFLUENCE OF AGEING OVER NON ACTIVE MEDICAL DEVICES. Maria José Abreu.	777
4054	ULTRASONIC PEENING IN INDUSTRIAL APPLICATIONS. Jacob Kleiman.	815
3967	ANALYTICAL AND NUMERICAL ASSESSMENT OF FATIGUE PROPERTIES IN ROLLING BEARINGS. Paweł Romanowicz, Bogdan Szybiński.	809
4743	INFLUENCE OF COMPOSITE PATCH REPAIR ON FATIGUE CRACK GROWTH OF 6061 AL-ALLOY . Mustapha Benachour, Nadja Benachour, Mohamed Bengueidba.	827

WED, 09:30-11:00		SESSION 7A	Room A
Symp_32: FAILURE AND FATIGUE OF STRUCTURAL ELEMENTS			
Chair: Aleksander Muc (<i>Cracow U.T., Poland</i>)			
REF:	Title and Author(s):	Page:	
3962	EXPERIMENTAL INVESTIGATIONS OF METAL HIGH-PRESSURE WAVE-RING GASKET. Andrzej Trojnacki, Bogdan Szybiński.	805	
3965	ON THE OPTIMAL CHOICE OF STRESS RELIEF GROOVES IN FLAT WELDED ENDS FOR PRESSURE VESSELS. Bogdan Szybiński.	807	
3968	APPLICATION OF MULTIAXIAL HIGH-CYCLE FATIGUE CRITERIA IN ANALYSIS OF ROLLER BEARINGS. Paweł Romanowicz.	811	
3975	MODELING OF FATIGUE DAMAGE EVOLUTION IN COMPOSITE STRUCTURES. Aleksander Muc, Piotr Kędziora, Zbigniew Krawiec.	813	
4335	EFFECTS OF FATIGUE ON THE INTEGRITY OF A FRICTION STIR WELDED STRINGER-TO-SKIN LAP JOINT CONTAINING RESIDUAL STRESSES. Michael Bach, Ali Merati, Michael Gharghouri.	817	

WED, 09:30-11:00		SESSION 7B	Room B
Symp_31: MICROMECHANICS AND HOMOGENIZATION OF HETEROGENEOUS MEDIA			
Chairs: Marek-Jerzy Pindera (<i>U. Virginia, USA</i>), Marcio A.A. Cavalcante (<i>F.U. Alagoas, Brazil</i>)			
REF:	Title and Author(s):	Page:	
3934	HOMOGENIZATION OF STRUCTURES WITH GENERALIZED PERIODICITY MADE OF ELASTOPLASTIC MATERIALS WITH HIGHLY CONTRASTED PROPERTIES. George Chatzigeorgiou, Dimitrios Tsallis, Theocharis Baxevanis, Nicolas Charalambakis.	785	
4676	EVALUATION OF EFFECTIVE THERMAL CONDUCTIVITY OF PERIODIC COMPOSITES WITH THERMAL BARRIER. Romildo S. Escarpini Filho, Severino P.C. Marques.	787	
4069	SOME APPROACHES FOR THE DETERMINATION OF EFFECTIVE PROPERTIES OF ACTIVE MULTIPHASE COMPOSITES. Andrey V. Nasedkin, Anna A. Nasedkina, Vladimir V. Remizov, Maria S. Shevtsova.	789	
4308	FAILURE RESPONSE OF FIBER-EPOXY UNIDIRECTIONAL LAMINATE UNDER TRANSVERSE TENSILE/COMPRESSIVE LOADING USING FINITE-VOLUME MICROMECHANICS. Zhanwen Tang, Boming Zhang, Yalin Yu.	791	
3894	A UNIFIED METHODOLOGY FOR THE HOMOGENIZATION OF PERIODIC MATERIALS WITH DAMAGE. Wenqiong Tu, Marek-Jerzy Pindera.	793	

WED, 09:30-11:00		SESSION 7C	Room C
Symp_11: INNOVATIVE JOINING PROCESSES			
Chair: Pedro Moreira (<i>INEGI, Portugal</i>)			
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4674	AA6082-T6 FRICTION STIR WELDED T JOINTS OPTIMIZATION. Ana C. F. Silva, Daniel F.O. Braga, M.A.V. Figueiredo, Pedro M.G.P. Moreira.	529	
4675	AA6082-T6 FRICTION STIR WELDED BUTT JOINTS OPTIMIZATION. Ana C. F. Silva, Daniel F.O. Braga, M.A.V. Figueiredo, Pedro M.G.P. Moreira.	531	

WED, 09:30-11:00		SESSION 7D	Room D
Symp_13: DYNAMICS, STABILITY AND CONTROL IN ENGINEERING STRUCTURES			
Chair: Rui C. Barros (<i>U. Porto, Portugal</i>)			
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4006	DYNAMIC BEHAVIOUR OF A GUYED TOWER: DESIGN STUDY. Cecília Mendonça, Rui C. Barros.	569	

4031	DESIGN OF LATTICE WIND TOWERS AND COMPARISON WITH THE TYPICAL SELF-SUPPORTED TUBULAR TOWERS. Jorge Henriques, Rui C. Barros.	571
4692	A DISPLACEMENT FORMULATION FOR CYLINDRICAL SHELLS UNDER RADIAL LOADS. Luísa Madureira, Elza M.M. Fonseca, Rui C. Barros.	573
4756	PASSIVE CONTROL OF CIVIL ENGINEERING STRUCTURES. Manuel Braz-César, Rui C. Barros.	575

WED, 09:30-11:00		SESSION 7E	Room E
Symp_07: MECHANICAL CHARACTERIZATION OF BONE BEHAVIOR			
Chairs: <i>Marcelo Moura (U. Porto, Portugal), Nuno Dourado (UTAD, Portugal)</i>			
REF:	Title and Author(s):		
4352	MODE I FRACTURE CHARACTERIZATION OF BOVINE BONE USING THE DCB TEST. F.A.M. Pereira, N. Dourado, M.F.S.F. Moura, J.J.L. Morais, F. Silva, M.I.R. Dias.	499	
4351	MODE II FRACTURE CHARACTERIZATION OF BOVINE BONE USING THE ENF TEST. F.A.M. Pereira, M.F.S.F. Moura, N. Dourado, J.J.L. Morais, F. Silva, M.I.R. Dias.	501	
4650	EFFECT OF BONE COMPOSITION AND APPARENT DENSITY ON LOCATIONAL VARIATION IN ELASTIC AND PLASTIC MODULI OF CORTICAL BONE. N.K. Sharma, D.K. Sehgal, R.K. Pandey.	503	
4680	LOWER LIMB MATHEMATICAL MODELING WITH INERTIAL MOTION CAPTURE DURING NORMAL WALKING. Gennady Aryassov, Artem Kuznetcov, Victor Musalimov, Sergei Zhigailov.	505	

WED, 09:30-11:00		SESSION 7F	Room F
Topic_N: CASE STUDIES			
Chair: <i>Jan Chvojan (VZU Plzen, Czech Rep)</i>			
REF:	Title and Author(s):		
3859	IMPROVING THE BRAZILIAN ELECTRIC SYSTEM RELIABILITY THROUGH ENERGY FROM WASTE AS A DECENTRALIZED SOLUTION. Carlos Frederico Barros, Fernando Reichert, Sergio Godoy, Fernando Melo, Rodolfo Cardoso.	383	
3872	RELIABILITY MODEL EXPLOITATION IN INDUSTRIAL SYSTEM MAINTAINABILITY USING EXPERT SYSTEM EVALUATION. Ahmed Hafaifa, Belhadef Rachid, Guemana Mouloud.	387	
3909	SEISMIC EVALUATION OF A RC BRIDGE WITH MONOLITHIC CONNECTION OF MULTI-CELL CIRCULAR DECK AND PIERS. Omid Afsharian Zadeh, Araliya Mosleh.	389	
3931	A REVIEW ON CONSTRUCTION DETAILS THAT INFLUENCE THE STABILITY OF BRICK FAÇADES. Tiago T. Martins, Borja J. Salado, Suyapa Sánchez-Toscano, Ramón A. Cabal.	391	
4016	ANALYSIS OF AN APARTMENTS BUILDING SURMONTED BY A TANK WITH A CONTAINER CAPACITY OF 1000 M3 IN ALGIERS. Said Hamitouche, Hocine Hammoum, Karima Bouzelha, Naceur E. Hannachi.	393	
3971	FATIGUE SERVICE LIFE TEST OF THE TRIPPLE HYBRID HYDROGEN FUEL CELL BUS STRUCTURE. Jaroslav Václavík, Jan Chvojan.	395	

WED, 09:30-11:00		SESSION 7G	Room G
Symp_27: STRUCTURAL HEALTH MONITORING OF ADVANCED STRUCTURES			
Chairs: <i>Júlio C. Viana (Critical Materials, Portugal), Gustavo Dias (Critical Materials, Portugal)</i>			
REF:	Title and Author(s):		
3907	VIBRATION BASED HEALTH MONITORING AND DAMAGE DIAGNOSIS OF COMPOSITE BEAM STRUCTURE. Eldho Jacob Joy, Arun Kumar Saha.	727	
3911	IN-SITU STRUTURAL INTEGRITY EVALUATION FOR A HIGH POWER PULSED SPALLATION NEUTRON SOURCE. Masatoshi Futakawa, Takashi Wakui, Makoto Teshigawara, Takashi Naoe.	729	
3990	IMPACT & DAMAGE LOCATION IN COMPOSITE STRUCTURES BY SPATIAL SIGNAL CORRELATION ANALYSIS. Júlio C. Viana, Nelson J. Ferreira, Paulo J. Antunes, Gustavo R. Dias.	733	
4122	DEVELOPMENT OF INTELLIGENT HEALTH MONITORING SYSTEM FOR ROTATING MACHINERY AND STRUCTURAL COMPONENTS. A.A. Lakis, Ali Mahvash, M.H. Toorani.	735	
4642	MODELING OF GUIDED WAVE INTERACTION WITH DISBONDS IN HONEYCOMB COMPOSITE SANDWICH PLATES SUBJECT TO PZT EXCITATIONS. Pol Chandrakant, Banerjee Sauvik.	737	

WED, 09:30-11:00		SESSION 7H	Room G
Topic_L: ENERGY AND THERMO-FLUIDS SYSTEMS			
Chairs:	<i>Clito Afonso (U. Porto, Portugal)</i>		
REF:	Title and Author(s):		Page:
4007	IMPLEMENTATION OF A HYDRIC ENERGY HARVESTING SYSTEM FOR WIRELESS SENSOR NETWORKS. Filipe Santos, Joaquim Azevedo.		357
4049	THE EFFECT OF THERMAL BARRIER COATING ON THE LIFE EXTENTION OF A GAS TURBINE ROTARY BLADE. Reza Torabieh, Saeed A. Kouhanjani, Hamid M. Zoka, Maryam Torfeh, Reza Ghorbani.		363
4112	OPTIMIZATION OF FUEL CONSUMPTION IN COMPRESSOR STATIONS. T.M. Elshiekh, H.A. El Mawgoud.		365
4744	UNCERTAINTY QUANTIFICATION IN FLOW ASSURANCE APPLICATIONS THROUGH SURROGATE MODELLING APPROXIMATIONS. Athanasios Kolios, Konstantinos Saloniatis.		367

THU, 11:00 - 11:30	COFFEE-BREAK	Lounge

WED, 11:30-13:00		SESSION 8A	Room A
Symp_32: FAILURE AND FATIGUE OF STRUCTURAL ELEMENTS			
Chair:	<i>Aleksander Muc (Cracow U.T., Poland)</i>		
REF:	Title and Author(s):		Page:
4644	STRESS INTENSITY FACTOR COMPUTATION: EXTENDED FINITE ELEMENT METHOD APPLIED TO 3D ENGINEERING PROBLEMS. A. Luís Silva, Hubert Maigre, Anthony Gravouil, Abílio M.P. Jesus, António A. Fernandes.		819
4677	ULTRASONIC MEASUREMENT OF RESIDUAL STRESSES IN WELDED ELEMENTS. Yuri Kudryavtsev.		821
4705	UNDERWATER ULTRASONIC PEENING OF WELDED ELEMENTS AND STRUCTURES. Yuri Kudryavtsev, Jacob Kleiman, Alexander Lugovskoy.		823
4711	CHARACTERIZATION OF X60 STEEL GRADE UNDER ULTRA LOW CYCLE FATIGUE LOADING. João Pereira, Abílio Jesus, José Xavier, António A. Fernandes.		825

WED, 11:30-13:00		SESSION 8B	Room B
Symp_31: MICROMECHANICS AND HOMOGENIZATION OF HETEROGENEOUS MEDIA			
Chairs:	<i>Marcio A.A. Cavalcante (F.U. Alagoas, Brazil), Marek-Jerzy Pindera (U. Virginia, USA)</i>		
REF:	Title and Author(s):		Page:
4081	GENERALIZED FVDAM THEORY FOR PERIODIC MATERIALS UNDERGOING FINITE DEFORMATIONS. Marcio A.A. Cavalcante.		795
4239	DISPERSION MONITORING ANALYSIS AND OPTIMISATION FOR EPOXY NANOREINFORCEMENT. Alkiviadis Paipetis, Giorgos Gikas.		797
3933	HOMOGENIZATION OF MAGNETORHEOLOGICAL ELASTOMERS CONSIDERING GEOMETRICAL NONLINEARITIES. George Chatzigeorgiou, Ali Javili, Paul Steinmann.		799
3887	TARGETING THE RESPONSE OF BIOLOGICAL TISSUE VIA FINITE-VOLUME MICROMECHANICS. Wenqiong Tu, Marek-Jerzy Pindera.		801

WED, 11:30-13:00		SESSION 8C	Room C
Symp_26: ADVANCES IN FIBROUS AND COMPOSITE MATERIALS FOR CIVIL ENGINEERING			
Chairs:	<i>Raúl Fangueiro (U. Minho, Portugal), Sohel Rana (U. Minho, Portugal)</i>		
REF:	Title and Author(s):		Page:
4747	NANO-REINFORCED CONCRETE: AN INTELLIGENT AND HIGH PERFORMANCE CONSTRUCTION MATERIAL. Sohel Rana, Shama Parveen, Raul Fangueiro.		711
4091	FLEXURAL BEHAVIOUR OF BRICK MASONRY RETROFITTED WITH BRAIDED TEXTILE MESHES. Graça Vasconcelos, Juan Mora, Raul Fangueiro, Fernando Cunha, Andreia Martins.		713

3940	DEVELOPMENT OF NEW BRAIDED FIBROUS MATERIALS FOR RETOFITTING OF MASONRY WALLS. Fernando Cunha, Sérgio Patinha, Sohel Rana, Raul Fangueiro, Graça Vasconcelos.	715
4076	MICRO-STRUCTURE AND MECHANICAL PROPERTIES OF CARBON NANOTUBE/CEMENT NANOCOMPOSITES. Shama Parveen, Sohel Rana, Raul Fangueiro.	717
3999	COMPARATIVE ASSESSMENT OF FRP'S AND STEEL BARS APPLIED ON THE REINFORCEMENT OF CONCRETE STRUCTURES. Sérgio Patinha, Sara Neiva, Sohel Rana, Raul Fangueiro, Luís Bragança, Ricardo Mateus.	719
4011	VARIOUS CONTROL METHODS DEVELOPED FOR FIBRE- CONCRETE STRUCTURES. Leonard Hobst, Petr Bílek.	721

WED, 11:30-13:00		SESSION 8D	Room D
Symp_17: CONCRETE MATERIAL PERFORMANCE			
Chairs: Nuno Dourado (UTAD, Portugal), Marcelo Moura (U. Porto, Portugal)			
REF:	Title and Author(s):		Page:
3976	MIXING DURATION EFFECTS ON THE PERFORMANCES OF SELF-COMPACTING CONCRETE WITH LIMESTONE'S FINE. S. Bensalem, H. Houari.		623
4002	EFFECTS OF MINERAL PRODUCTS AND CURING TIME ON THE BEHAVIOR OF NEW CONCRETE. Djihen Benchiheub, Chahinez Amouri, Hacène Houari Hacène.		625
4078	PERFORMANCE OF THE SELF-COMPACTING CONCRETE WITH DIFFERENT MINERAL ADMIXTURES. S. Bensalem, H. Houari.		627
4696	INFLUENCE OF THE SPECIMEN MOLD IN THE CONCRETE COMPRESSIVE STRENGTH TEST. Lino Maia, Cádia Caetano, Miguel Correia.		629
4774	DETERMINATION OF THE CONCRETE COHESIVE LAW UNDER MODE I LOADING USING AN INVERSE METHOD. N. Dourado, F. Silva, J. Xavier, M.S.F.S. Moura		635

WED, 11:30-13:00		SESSION 8E	Room E
Symp_30: MEDICAL DEVICES AND HEALTHCARE MATERIALS			
Chairs: Maria José Abreu (U. Minho, Portugal), André Catarino (U. Minho, Portugal)			
REF:	Title and Author(s):		Page:
4051	NUMERICAL SIMULATION OF BIODEGRADABLE POLYMERS CONSIDERING VISCOPLASTIC BEHAVIOUR. André Vieira, Rui M. Guedes, Volnei Tita.		773
4060	TEXTILE DESIGN OF STUCTURES WITH FUNCTIONAL PROPERTIES REPELLENCE FLYER OF MALARIA. Cláudia Pinheiro, Maria José Geraldes.		775
4701	APPLICATIONS OF TEXTILE BASED ELECTRODES IN GAIT ANALYSIS – PROLIMB PROJECT. André Catarino, Ana M. Rocha, Maria José Abreu, José M. Silva, José C. Ferreira, Vitor G. Tavares, Miguel V. Correia, Fardin Derogarian, Rúben Dias.		779
4752	NARROW BAND IMAGING TECHNIQUE FOR ENDOSCOPY IN THE SMALL BOWEL. M.F. Silva, S. Lamas, C. Costa, C. Lima, C. Silva, G. Minas, P.M. Mendes, J.P. Carmo, L.M. Goncalves, J.H. Correia.		781

WED, 11:30-13:00		SESSION 8F	Room F
Topic_N: CASE STUDIES			
Chair: Jorge Lino (U. Porto, Portugal)			
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3910	A MICROSCOPIC FAILURE ANALYSIS OF MEDIUM TRUCK BRAKE DISCS. Arie Bussiba, Rami Carmi, Igal Alon.		397
4726	CELLULAR AUTOMATON METHOD APPLIED FOR MICROSTRUCTURE PREDICTION OF Al-Si CASTING TREATED BY LASER BEAM. Zenon Ignaszak, Paweł Popielarski, Jakub Hajkowski, Bartłomiej Dudziak, Marek Gościński.		401
4678	FLUTTER ANALYSIS OF A COMPOSITE VARIABLE-SPAN WING. Pedro V. Gamboa, Pedro D.R. Santos, José M.A. Silva, Pedro M.B. Santos.		403
4618	DEBONDING OF HOT-EMBOSSING POLYMERIC MICROFLUIDIC SUBSTRATE: INFLUENCE OF SUBSTRATE THICKNESS ON DEMOLDING BEHAVIOR . Jeffry William Tani, Yue Chee Yoon.		405
4679	STRUCTURAL DESIGN OF A COMPOSITE VARIABLE-SPAN WING. Pedro D.R. Santos, Pedro V. Gamboa, Pedro M.B. Santos, José M.A. Silva.		407

4708	MAINTENANCE ON CONDITION AND CORRECTIVE MAINTENANCE: EMPHASIS ON ASSET RELIABILITY IN INDUSTRIAL SECTOR. Eloi Dutra, Claudinei J. Oliveira, Gilmar Cordeiro, Thiago H.A. Souza.	409
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WED, 11:30-13:00		SESSION 8G	Room G
Symp_1: SMART STRUCTURES AND MATERIALS			
Chair: Maria José Geraldes (<i>UBI, Portugal</i>)			
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4046	DEVELOPMENT OF TECHNICAL CLOTHING FOR EVERYDAY WITH FUNCTIONAL AND SMART STRUCTURES. Catarina Lopes, Maria José Geraldes.	415	
4056	A MECHANICAL ANALYSIS OF MAGNETORHEOLOGICAL COMPOSITES USED FOR DAMPING OF THE VIBRATION. Anna Boczkowska, Stefan F. Awietjan, Danuta Miedzinska, Grzegorz Sławiński, Tadeusz Niezgoda.	417	
4086	FUNCTIONAL KINNITTING FOR CHILDREN SEGMENT: THE "DRY BABY" BODY. Ana Luiza Olivete, Maria José Geraldes.	419	
4626	STATIC AND DYNAMIC SHAPE CONTROL OF LAMINATED BEAMS WITH RESISTEVELY INTERCONNECTED PIEZOELECTRIC PATCHES. Juergen Schoeftner, Gerda Buchberger.	421	
4671	CHARACTERIZATION OF THERMOPLASTIC-COMPATIBLE PIEZOCERAMIC MODULES FOR FUNCTION INTEGRATIVE COMPOSITE STRUCTURES. T. Heber, M. Gude, W. Hufenbach, M. Dannemann, A. Winkler, T. Weber.	423	

WED, 11:30-13:00		SESSION 8H	Room H
Symp_20: THERMODYNAMICS AND THERMO-FLUID SYSTEMS			
Chairs: Clito F. Afonso (<i>FEUP, Portugal</i>) and Carlos C. António (<i>FEUP, Portugal</i>)			
REF:	Title and Author(s):	Page:	
4772-IP	MEASUREMENT OF AIR INFILTRATION, NATURAL VENTILATION AND DUCTS AIRFOWS WITH TRACER GAS TECHNIQUE: CASE STUDIES. Clito F. Afonso. (<i>Invited Paper</i>)	687	
4059	FLUID, NANOFUID AND MAGNETIC FLUID SLIP FLOW IN RECTANGULAR AND CIRCULAR MICROCHANNELS AND MINICHANNELS. Jurij Avsec.	689	
4084	INTEGRITY, RELIABILITY & FAILURE IN REFRIGERATION SYSTEMS FOR DRAUGHT DRINKS. Clito F. Afonso, João Faria, Armando Oliveira, Miguel Tavares, Ricardo Reis, Joaquim Gabriel, Armando Araújo, Jorge Dias Pires, Cristina Silva.	691	
4118	OPTIMIZATION OF THE ANNUAL SOLAR IRRADIATION AVAILABILITY IN URBAN ENVIRONMENT. Carlos C. António, João B. Monteiro, Clito F. Afonso.	693	
4773	THERMAL IMPROVEMENTS IN HOUSEHOLD REFRIGERATORS. Clito F. Afonso	695	

WED, 13:00 - 13:30		CLOSING SESSION	Room A
CLOSING SESSION (Conference Organizing Committee)			

WED, 13:30 - 15:00		LUNCH	REST
LUNCH AND END OF CONFERENCE			

IRF2013 PROGRAM

FUNCHAL, 23-27 JUNE 2013

Time	SUNDAY (JUNE 23)	MONDAY (JUNE 24)							TUESDAY (JUNE 25)							WEDNESDAY (JUNE 26)						
08:00	REGISTRATION							REGISTRATION							REGISTRATION							
09:00	OPENING SESSION							POSTERS SESSION II Topics: H to N							POSTERS SESSION IV Symposia 16 to 32							
10:00	PLENARY SESSION I Prof. Shaker Meguid (U. Toronto, Canada)							PLENARY SESSION III Prof. E.A. Elsayed (Rutgers University, USA)							COFFEE-BREAK							
11:00	PLENARY SESSION II Prof. Xiong Zhang (U. Tsinghua, China)							PLENARY SESSION IV Prof. Noritsugu Umehara (Nagoya Univ., Japan)							COFFEE-BREAK							
12:00	LUNCH							LUNCH							COFFEE-BREAK							
13:00	LUNCH							LUNCH							COFFEE-BREAK							
14:00	POSTERS SESSION I Topics: A to G							POSTERS SESSION III Symposia: 1 to 15							CLOSING SESSION							
15:00	CONFERENCE RECEPTION							CONFERENCE BANQUET							LUNCH & END OF CONFERENCE							
16:00	CONFERENCE RECEPTION							CONFERENCE BANQUET							COFFEE-BREAK							
17:00	CONFERENCE RECEPTION							CONFERENCE BANQUET							COFFEE-BREAK							
18:00	CONFERENCE RECEPTION							CONFERENCE BANQUET							COFFEE-BREAK							
19:00	CONFERENCE RECEPTION							CONFERENCE BANQUET							COFFEE-BREAK							
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