

1st International Conference on Materials and Energy (ICOME'15) and 2nd International Conference on Materials and Energy (ICOME'16)

Energy Procedia Volume 139

Tetouan, Morocco
17 – 18 May 2015

La Rochelle, France
17 – 20 May 2016

Editors:

**R. Belarbi
R. Bennacer**

**M. El Ganaoui
A. Mimet**

ISBN: 978-1-5108-5589-2

Printed from e-media with permission by:

Curran Associates, Inc.
57 Morehouse Lane
Red Hook, NY 12571



Some format issues inherent in the e-media version may also appear in this print version.

Copyright© by Elsevier B.V.
All rights reserved.

Printed by Curran Associates, Inc. (2018)

For permission requests, please contact Elsevier B.V.
at the address below.

Elsevier B.V.
Radarweg 29
Amsterdam 1043 NX
The Netherlands

Phone: +31 20 485 3911
Fax: +31 20 485 2457

<http://www.elsevierpublishingsolutions.com/contact.asp>

Additional copies of this publication are available from:

Curran Associates, Inc.
57 Morehouse Lane
Red Hook, NY 12571 USA
Phone: 845-758-0400
Fax: 845-758-2633
Email: curran@proceedings.com
Web: www.proceedings.com

TABLE OF CONTENTS

ICOME 15 FOREWORD	1
<i>R. Bennacer, M. El Ganaoui, A. Mimet</i>	
SENSOR FAULTS DETECTION AND ESTIMATION FOR A DFIG EQUIPPED WIND TURBINE	3
<i>Samir Abdelmalek, Sarah Rezazi, Ahmad Taher Azar</i>	
THERMAL IMPACT STUDY OF A BIO-BASED WALL COUPLED WITH AN INNER PCM LAYER	10
<i>Yassine Kharbouch, Abdelaziz Mimet, Mohammed El Ganaoui</i>	
NUMERICAL STUDY OF A COLD STORAGE SYSTEM FOR AIR COOLING	16
<i>Laila Khatra, Hamid El Qarnia, Mohammed El Ganaoui</i>	
MODELING OF HEAT AND MASS TRANSFER OF ADSORBER TUBE USING ACTIVATED CARBON/ METHANOL (AC/CH₃OH) PAIRS	23
<i>Hamdi Abdelghani, Abdelaziz Mimet, Abdellah Maalouf</i>	
INFLUENCE OF ASPECT RATIO ON THE NATURAL CONVECTION AND ENTROPY GENERATION IN RECTANGULAR CAVITIES WITH WAVY-WALL	29
<i>Souad Morsli, Amina Sabeur, Mohammed El Ganaoui</i>	
APPLICATION OF MULTILAYER PERCEPTRON FOR PREDICTION OF THE RAT ACUTE TOXICITY OF INSECTICIDES	37
<i>Mabrouk Hamadache, Othmane Benkortbi, Salah Hanini, Abdeltif Amrane</i>	
MODELING AND OPTIMIZATION OF DISTILLATION TO PRODUCE BIOETHANOL	43
<i>Ahmed Tgarguifa, Souad Abderafi, Tijani Bounahmidi</i>	
A GENERAL FRACTIONAL-ORDER HEAT TRANSFER MODEL FOR PHOTOVOLTAIC/THERMAL HYBRID SYSTEMS AND ITS OBSERVER DESIGN	49
<i>Lahoucine Ouhsaine, Yassine Boukal, Mohammed El Ganaoui, Mohammed Darouach, M. Zasadzinski, A. Mimet, Nour Eddine Radhy</i>	
DESIGN AND SIMULATION OF DUAL-BAND RF ENERGY HARVESTING ANTENNA FOR WSNS	55
<i>Asma Bakkali, José Pelegri-Sebastia, Tomas Sogorb, Antonio Bou-Escriva, Abdelouahid Lyhyaoui</i>	
MODELING THE STABILIZATION COLUMN IN THE PETROLEUM REFINERY	61
<i>Ahmed Ould Brahim, Souad Abderafi, Tijani Bounahmidi</i>	
ANALYSIS OF A THERMAL SYSTEM BY CONTACT FOR DEFECT DETECTION IN HOMOGENEOUS MATERIALS – VALIDATION BY INFRARED THERMOGRAPHY	67
<i>Ahmed Kabouri, Abdelhamid Khabbazi, Hussein Youlal</i>	
EXPERIMENTAL STUDY OF SENSIBLE HEAT STORAGE/RETRIEVAL IN/FROM A NANOFLUID ENCLOSED BETWEEN CONCENTRIC ANNULAR TUBES	73
<i>Latifa El-Kaddadi, Mohamed Asbik, Omar Zegaoui, Nadia Zari, Abdellah Bah</i>	
THERMODYNAMIC ANALYSIS OF THE COMBINED CSP AND DESALINATION IN ALGERIA	79
<i>M. Laïssaoui, A. Touil, D. Nehari</i>	
NUMERICAL STUDY OF THE MELTING OF NANO-PCM IN A RECTANGULAR STORAGE UNIT HEATED BY UPWARD HEAT TRANSFER FLUID	86
<i>Radouane Elbahjaoui, Hamid El Qarnia, Mohammed El Ganaoui</i>	
THERMAL BEHAVIOR IN DYNAMIC REGIME OF A MULTILAYER ROOF PROVIDED WITH TWO PHASE CHANGE MATERIALS IN THE CASE OF A LOCAL CONDITIONED	92
<i>Nisrine Hanchi, Hamid Hamza, Jawad Lahjomri, Abdelaziz Oubarra</i>	
KINETIC STUDY AND OPTIMIZATION OF EXTRACTION PROCESS CONDITIONS	98
<i>Sarah Rezazi, Samir Abdelmalek, Salah Hanini</i>	
NUMERICAL STUDY OF THE THERMAL BEHAVIOR OF A NOVEL COMPOSITE PCM/CONCRETE WALL	105
<i>M. Faraji</i>	
ON THE SHORELINE WAVE ENERGY POTENTIAL AND ITS CONVERSION IN MOROCCO	111
<i>Hafsa Bouhrim, Abdellatif El Marjani</i>	
OPTIMIZING INSULATION THICKNESS OF EXTERNAL WALLS IN COLD REGION OF MOROCCO BASED ON LIFE CYCLE COST ANALYSIS	117
<i>Rachida Idchabani, Ahmed Khyad, Mohamed El Ganaoui</i>	
NUMERICAL STUDY OF THE EVAPORATION OF A LIQUID FILM WITH A LOW NANOPARTICLES VOLUME FRACTION	122
<i>Monssif Najim, M'Barek Feddaoui, Abderrahman Nait Alla, Adil Charef</i>	

NUMERICAL STUDY OF HUMID AIR CONDENSATION IN PRESENCE OF NON-CONDENSABLE GAS ALONG AN INCLINED CHANNEL	128
<i>Adil Charef, M'Barek Feddaoui, Abderrahman Nait Alla, Monssif Najim</i>	
LATTICE-BOLTZMANN MODELING OF FORCED CONVECTION IN A LID-DRIVEN SQUARE CAVITY FILLED WITH A NANOFLUID AND CONTAINING A HORIZONTAL THIN HEATER	134
<i>Y. Dahani, M. Hasnaoui, A. Amahmid, S. Hasnaoui</i>	
LATTICE-BOLTZMANN MODELING OF NATURAL CONVECTION IN A CAVITY WITH A HEATED PLATE INSIDE	140
<i>M. Alouah, M. Hasnaoui, A. Amahmid, K. Rehali</i>	
LATTICE BOLTZMANN MODELING OF THE DISSOLUTION PROCESS OF SILICON INTO GERMANIUM USING A SIMPLIFIED CRYSTAL GROWTH TECHNIQUE	147
<i>Farid Mechighel, Niel Armour, Sadik Dost, Mohammed El Ganaoui, Mahfoud Kadja</i>	
MODELING AND SIMULATION OF AN AUTONOMOUS PV GENERATOR DEDICATED TO SUPPLY AN AGRICULTURAL PUMPING STATION	153
<i>Bennacer El Hassouni, Ali Haddi, Abdellatif Ghacham Amrani</i>	
NUMERICAL SIMULATION OF THE FLOW FIELD ANALYSIS IN THE MIXING TWIN JETS	161
<i>Mustapha Boussoufi, Amina Sabeur-Bendehina, M. El Ganaoui, Souad Morsli, A. Ouadha</i>	
AN EXAMPLE OF FEASIBILITY STUDY OF ECO MATERIALS PRODUCTION CHAIN AND BIO-BASED PRODUCTS FOR ECO-CONSTRUCTION/RENOVATION IN THE NAMED GREATER REGION (BELGIUM, FRANCE, LUXEMBOURG)	167
<i>Faiza Mnasri, Mohammed El Ganaoui, Mourad Khelifa, Slimane Gabsi</i>	
LATTICE BOLTZMANN APPLICATION FOR A VISCOPLASTIC FLUID FLOW AND HEAT TRANSFER INTO CUBIC ENCLOSURES	173
<i>Abdelkader Boutra, Karim Ragui, Nabila Labsi, Youb Khaled Benkahla, Rachid Bennacer</i>	
THE SOLAR DOMESTIC WATER HEATING SYSTEM IN THE SIX MOROCCAN CLIMATE ZONES	180
<i>Ibtissam Fellak, Mohammed El Ganaoui, Abdelaziz Mimet, Abdellah Maalouf</i>	
THE LATTICE BOLTZMANN METHOD FOR MIXED CONVECTION IN A CAVITY	186
<i>Samir Houat, Zine Elabidine Bouayed</i>	
INFLUENCE OF FLOW TOPOLOGY ON THE HEAT TRANSFER UPSTREAM A SINGLE PLATE-FINNED TUBE	192
<i>K. Khallaki, S. Hayani, K. Choukaïry</i>	
RAYLEIGH-BÉNARD MHD CONVECTION OF AL₂O₃-WATER NANOFLUID IN A SQUARE ENCLOSURE: MAGNETIC FIELD ORIENTATION EFFECT	198
<i>Mahdi Benzema, Youb Khaled Benkahla, Seif-Eddine Ouyahia</i>	
ICOME 16 FOREWORD	204
<i>M. El Ganaoui, R. Bennacer, R. Belarbi</i>	
ELECTRONIC PROPERTIES OF PHOSPHORENE NANORIBBONS	207
<i>M. Boutahir, S. El Majdoub, Ah. Rahmani, B. Fakrach, H. Chadli, A. Rahmani</i>	
THEORETICAL INFRARED PHONON MODES AND BAND GAP CALCULATIONS OF A BUNDLE OF TWO SINGLE WALLED CARBON NANOTUBES	211
<i>Ah. Rahmani, M. Boutahir, B. Fakrach, H. Chadli, A. Rahmani</i>	
FREE CONVECTION HEAT TRANSFER OF NANOFLUIDS INTO CUBICAL ENCLOSURES WITH A BOTTOM HEAT SOURCE: LATTICE BOLTZMANN APPLICATION	217
<i>Abdelkader Boutra, Karim Ragui, Rachid Bennacer, Youb Khaled Benkahla</i>	
INFLUENCE OF THE POZZOLANIC REACTIVITY OF THE BLAST FURNACE SLAG (BFS) AND METAKAOLIN ON MORTARS	224
<i>Kamal Abdelli, Mahfoud Tahlaiti, Rafik Belarbi, Mohamed Nadjib Oudjit</i>	
INFLUENCE OF THE ORIGIN OF METAKAOLIN ON POZZOLANIC REACTIVITY OF MORTARS	230
<i>Kamal Abdelli, Mahfoud Tahlaiti, Rafik Belarbi, Mohamed Nadjib Oudjit</i>	
RISK-EU METHOD APPLIED TO THE ALGERIAN CITY OF ARZEW TO ASSESS EXPOSURE TO EARTHQUAKES	236
<i>Aouane Abderrahim, Rahal D. Driss, A. H. Mohammed Belhadj</i>	
RESUSPENSION OF INDOOR PARTICLES DUE TO HUMAN FOOT MOTION	242
<i>A. Benabed, K. Limam</i>	
PERFORMANCE IMPROVEMENT OF COMBINED ORGANIC RANKINE-VAPOR COMPRESSION CYCLE USING SERIAL CASCADE EVAPORATION IN THE ORGANIC CYCLE	248
<i>Oumayma Bounefour, Ahmed Ouadha</i>	

COMPARATIVE ASSESSMENT OF LNG AND LPG IN HCCI ENGINES	254
<i>Mohammed Djermouni, Ahmed Ouadha</i>	
OXIDATION OF A NANOSTRUCTURED SUPERALLOY OF HIGH TEMPERATURE.....	260
<i>S. Aklouche-Benouagouef, S. Adjal, D. Miroud</i>	
MESO-SCALE ANALYSIS OF THE AGGREGATE SIZE INFLUENCE ON THE MECHANICAL PROPERTIES OF HETEROGENEOUS MATERIALS USING THE BRAZILIAN SPLITTING TEST.....	266
<i>Al-Khazraji Hayder, Benkemoun Nathan, Choinska Marta, Khelidj Abdelhafid</i>	
NUMERICAL STUDY OF THE IMPACT OF CO2 DILUTION ON EMISSIONS IN TURBULENT DIFFUSION FLAME.....	273
<i>Amar Hadej, Abdelbaki Mameri, Fouzi Tabet, Zeroual Aouachria</i>	
OPTIMIZATION OF ABSORPTION REFRIGERATION SYSTEMS BY DESIGN OF EXPERIMENTS METHOD.....	280
<i>Ridha Ben Iffa, Nahla Bouaziz, Lakdar Kairouani</i>	
ENERGETIC AND EXERGETIC ANALYSIS OF A NOVEL MIXTURE FOR AN ABSORPTION/COMPRESSION REFRIGERATION SYSTEM: R245FA/DMAC.....	288
<i>D. Lounissi, N. Bouaziz, M. Ganaoui</i>	
HEMP-STRAW COMPOSITES: THERMAL AND HYGRIC PERFORMANCES	294
<i>F. Collet, S. Prétot, C. Lanos</i>	
REHAFUTUR – INSITU INSTRUMENTATION FOR A COMPREHENSIVE BUILDING ANALYSIS	301
<i>Radhouan Derbal, Alain Lucas, Franck Brachelet, Didier Defer, Emmanuel Antczak</i>	
THERMAL CHARACTERISTIC IN SOLAR AIR HEATER FITTED WITH PLATE BAFFLES AND HEATING CORRUGATED SURFACE.....	307
<i>Djamel Sahel, Redouane Benzeguir</i>	
CRYSTAL GROWTH KINETICS OF SUGAR ALCOHOLS AS PHASE CHANGE MATERIALS FOR THERMAL ENERGY STORAGE.....	315
<i>M. Duquesne, A. Godin, E. Palomo Del Barrio, F. Achchaq</i>	
MICROSCOPIC SWELLING ANALYSIS OF SPRUCE WOOD IN SORPTION CYCLE	322
<i>C. El Hachem, K. Abahri, R. Bennacer</i>	
EFFECT OF LOCATIONS AND THICKNESSES FOR THE DIFFERENT MATERIAL CONSTITUTING A BUILDING WALL	328
<i>El Mehdi El Khattabi, Mohamed Mharzi</i>	
TRNSYS VALIDATION OF A STUDY ON BUILDING’S ENERGETIC EVALUATION IN NORTH OF MOROCCO	334
<i>F. Eddib, M. A. Lamrani, S. Ait Bouyahia</i>	
NUMERICAL INVESTIGATION OF TRANSIENT NATURAL CONVECTION IN PARTITIONED CAVITY FILLED WITH WATER.....	340
<i>Farah Zemani-Kaci, Amina Sabeur-Bendehina</i>	
A PROPOSITION OF PERITECTIC STRUCTURES AS CANDIDATES FOR THERMAL ENERGY STORAGE.....	346
<i>F. Achchaq, E. Palomo Del Barrio</i>	
BUBBLE AGITATION AS A NEW LOW-INTRUSIVE METHOD TO CRYSTALLIZE GLASS-FORMING MATERIALS	352
<i>A. Godin, M. Duquesne, E. Palomo Del Barrio, F. Achchaq, P. Monneyron</i>	
ON THE SEMI-ANALYTICAL SOLUTION OF INTEGRO-PARTIAL DIFFERENTIAL EQUATIONS	358
<i>Abdelmalek Hasseine, Menwer Attarakih, Rafik Belarbi, Hans Jörg Bart</i>	
CHLORIDE TRANSPORT ON PARTIALLY SATURATED CONCRETE MEDIA: THE INFLUENCE OF THE HYDRIC STATE	367
<i>Hayet Chalabi, Abdelillah Bezzar, Abdelhafid Khelidj</i>	
A CFD COMSOL MODEL FOR SIMULATING COMPLEX URBAN FLOW	373
<i>Saddok Houda, Rafik Belarbi, Nouredine Zemmouri</i>	
ANALYSIS OF EXTERIOR SHADING BY OVERHANGS AND FINS IN HOT CLIMATE.....	379
<i>Rachida Idchabani, Mohamed El Ganaoui, Friedrich Sick</i>	
REHABILITATION STUDY OF CONSTRUCTION BUILT IN SEISMIC ZONE ON ALGERIA.....	385
<i>Imane Djafar Henni, Amar Kassoul</i>	
CORRELATION BETWEEN THE ACOUSTIC FIELD AND THE TRANSVERSE VELOCITY IN A PLANE IMPINGING JET IN THE PRESENCE OF SELF-SUSTAINING TONES	391
<i>H. H. Assoum, J. Hamdi, K. Abed-Meraïm, M. El Hassan, M. Ali, A. Sakout</i>	

EXPERIMENTAL INVESTIGATION THE TURBULENT KINETIC ENERGY AND THE ACOUSTIC FIELD IN A RECTANGULAR JET IMPINGING A SLOTTED PLATE	398
<i>H. H. Assoum, J. Hamdi, K. Abed-Meraïm, M. El Hassan, A. Hammoud, A. Sakout</i>	
VOLUME RECONSTRUCTION OF A PLANE JET IMPINGING ON A SLOTTED PLATE USING THE PHASE AVERAGING TECHNIQUE.....	404
<i>J. Hamdi, H. H. Assoum, K. Abed-Meraïm, A. Sakout</i>	
FINITE ELEMENT MODELING OF POLYDISPERSE FLOWS USING THE DIRECT QUADRATURE METHOD OF MOMENTS	410
<i>Bart Janssens, Walter Bosschaerts, Karim Limam</i>	
HYDRIC AND STRUCTURAL APPROACHES FOR EARTH BASED MATERIALS CHARACTERIZATION	417
<i>Boudjemaa Remki, Kamilia Abahri, Rafik Belarbi, Mahmoud Bensaïbi</i>	
PARAMETRIC STUDY ON NATURAL CONVECTION OF NANOFLUIDS IN A HEATED CHAMBER	424
<i>El Hafad Bara, Sakina El Hamdani, A. Bendou, Karim Limam</i>	
NUMERICAL STUDY OF TRANSPORT AND PARTICLE DEPOSITION INSIDE BUILDINGS	430
<i>K. Limam, S. El Hamdani, M. Abadie, G. Lindner, A. Bendou</i>	
EXPERIMENTAL STUDY OF PARTICLE CONCENTRATIONS IN AN UNDERGROUND MAGENTA METRO STATION OF PARIS	437
<i>A. Fortain, K. Limam, C. Cremezi Charlet, G. Lindner</i>	
MRT-SCHEME APPLIED TO COMBINED NATURAL CONVECTION AND THERMAL RADIATION IN A CAVITY PARTIALLY HEATED FROM ONE VERTICAL SIDE AND COOLED FROM ABOVE.....	444
<i>K. Rehhal, M. Hasnaoui, A. Raji, M. Alouah, A. El Mansouri, H. Beji</i>	
A SIMULATION BASED-OPTIMIZATION METHOD FOR ENERGY EFFICIENCY OF A MULTI-ZONE HOUSE INTEGRATED PCM.....	450
<i>Yassine Kharbouch, Abdelaziz Mimet, Mohammed El Ganaoui</i>	
INFLUENCE OF RECYCLED AGGREGATES ON THE MECHANICAL AND TRIBOLOGICAL BEHAVIOR OF CONCRETE.....	456
<i>K. Falek, K. Aoudjane, E. H. Kadri, F. Kaoua</i>	
EFFECT OF THE POSITION OF THE PHASE CHANGE MATERIAL (PCM NA2CO3•10H2O) ON THE SOLAR CHIMNEY EFFECT	462
<i>Liu Bin, Wang Meixia, Wang Qi, Mao Shaoli, Rachid Bennacer</i>	
ELABORATION AND CHARACTERIZATION OF ECO-MATERIALS MADE FROM RECYCLED OR BIO-BASED RAW MATERIALS.....	468
<i>L. M. Thieblessou, F. Collet, S. Prétot, C. Lanos, H. Kouakou, O. Boffoue</i>	
THE STUDY NATURAL VENTILATION BY USING BUILDINGS WINDOWS: CASE STUDY IN A HOT DRY CLIMATE, GHARDAÏA, ALGERIA.....	475
<i>M. Hamdani, S. M. A. Bekkouche, T. Benouaz, R. Belarbi, M. K. Cherier</i>	
A NEW APPROACH USING LATTICE BOLTZMANN METHOD TO SIMULATE FLUID STRUCTURE INTERACTION	481
<i>M. Benamour, E. Liberge, C. Beghein</i>	
CHARACTERIZATION OF HYGROTHERMAL TRANSFERS IN THE UNFIRED EARTH	487
<i>Dalel Medjelekh, Laurent Ulmet, Frédéric Dubois</i>	
SYNTHESIS AND CHARACTERISTICS OF COMPOSITE PHASE CHANGE HUMIDITY CONTROL MATERIALS	493
<i>Menghao Qin, Zhi Chen</i>	
COMPARATIVE STUDY OF THE PROPERTIES OF MORTARS WITH RECYCLED GLASS AGGREGATES INCORPORATED BY ADDITION AND SUBSTITUTION.....	499
<i>M. Bentchikou, S. Bouriah, N. Hamdane, F. Debieb, O. Boukendakdji</i>	
NUMERICAL STUDY OF TRANSFER BY CONVECTION IN A LID-DRIVEN CAVITY WITH A THIN PCM LAYER	505
<i>Binous Mohamed Sabeur, Abide Stéphane, Zegmati Belkacem, Hassis Hédi</i>	
CONTROL VOLUME FINITE ELEMENT METHOD FOR A BENCHMARK VALIDATION OF A NATURAL CONVECTION IN A SQUARE CAVITY	511
<i>Hasnat Mohammed, Abdellah Belkacem, Kaid Noureddine, Benachour Elhadj</i>	
EXPERIMENTAL VALIDATION OF A HAM-BES CO-SIMULATION APPROACH.....	517
<i>M-Y. Ferroukhi, R. Belarbi, K. Limam, W. Bosschaerts</i>	
DESIGN ANALYSIS OF MVC DESALINATION UNIT POWERED BY A GRID CONNECTED PHOTOVOLTAIC SYSTEM.....	524
<i>M. Ibrahim, A. Arbaoui, Y. Aoura</i>	

NUMERICAL SIMULATION OF CH₄-H₂-AIR NON-PREMIXED FLAME STABILIZED BY A BLUFF BODY	530
<i>Khaladi Fatma Zohra, Alliche Mounir, Chikh Salah</i>	
EXPERIMENTAL ASSESSMENT OF THE VARIABILITY OF CONCRETE AIR PERMEABILITY: REPEATABILITY, REPRODUCIBILITY AND SPATIAL VARIABILITY	537
<i>N. Issaadi, A. A. Hamami, R. Belarbi, A. Ait-Mokhtar</i>	
IMPACT OF FIBER TREATMENT ON THE FIRE REACTION AND THERMAL DEGRADATION OF BUILDING INSULATION STRAW COMPOSITE.....	544
<i>Naima Belayachi, Dashnor Hoxha, Brahim Ismail</i>	
EFFECT OF THE OCCUPANT AND THE INSIDE FACES COATING OF A MULTI-ALVEOLAR STRUCTURE ON THE UNSTEADY THERMAL BEHAVIOR OF A BI-ZONE BUILDING.....	550
<i>Nour Lajimi, Nour Ben Taher, Noureddine Boukadida</i>	
CALCULATION OF SEISMIC VULNERABILITY INDEX FOR STEEL STRUCTURES	558
<i>Amellal Omar, Bensaibi Mahmoud</i>	
EFFECT OF SUPPLEMENTARY CEMENTITIOUS MATERIALS (SCM) ON DELAYED ETTRINGITE FORMATION IN HEAT-CURED CONCRETES	565
<i>Yasser Amine, Nordine Leklou, Ouali Amiri</i>	
ALBEDO EFFECT OF EXTERNAL SURFACES ON THE ENERGY LOADS AND THERMAL COMFORT IN BUILDINGS.....	571
<i>Ouarda Mansouri, Rafik Belarbi, Fatima Bourbia</i>	
GREEN WALL IMPACTS INSIDE AND OUTSIDE BUILDINGS: EXPERIMENTAL STUDY.....	578
<i>Rabah Djedjig, Rafik Belarbi, Emmanuel Bozonnet</i>	
STUDY OF THE PORE SOLUTION AND THE MICROSTRUCTURE OF MINERAL ADDITIONS BLENDED CEMENT PASTES.....	584
<i>R. Cherif, A. A. Hamami, A. Ait-Mokhtar, J-F Meusnier</i>	
SOLIDIFICATION HEAT TRANSFER CHARACTERISTICS OF NANOPARTICLE-ENHANCED PHASE CHANGE MATERIAL INSIDE RECTANGULAR SLABS.....	590
<i>Radouane Elbahjaoui, Hamid El Qarnia, Mohammed El Ganaoui</i>	
THERMAL TRANSMITTANCE COMPARISON BETWEEN MULTILAYER WALLS MADE FROM HOLLOW FIRED CLAY AND PLASTER-GRANULAR CORK BRICKS USING ELECTRICAL ANALOGY.....	596
<i>Saad Raefat, Mohammed Garoum, Mohammed Souihel, Najma Laaroussi</i>	
FD-LBM SIMULATION OF THERMOSULCAL CONVECTION GENERATED IN AN INCLINED ENCLOSURE IN THE PRESENCE OF Soret AND Dufour Effects.....	602
<i>Safae Hasnaoui, A. Amahmid, A. Raji, M. Hasnaoui, Y. Dahani, H. Beji</i>	
SIMULATION OF PHOTOVOLTAIC INSTALLATION CONNECTED TO THE GRID WITH STORAGE SYSTEM	609
<i>S. Ben Mabrouk, H. Oueslati, A. Ben Mabrouk, G. Zizzo, D. Cascia, L. Dusonchet, S. Favuzza, F. Massaro</i>	
THREE-DIMENSIONAL SIMULATION OF NATURAL CONVECTION IN CUBIC CAVITY PARTIALLY FILLED WITH POROUS MEDIA.....	617
<i>F. Habbachi, F. S. Oueslati, R. Bennacer, M. Ganaoui, A. Elcafsi</i>	
SEISMIC VULNERABILITY CLASSIFICATION OF ROADS.....	624
<i>Sonia Adafer, Mahmoud Bensaibi</i>	
SIMULATION OF A BURNER WITH DIFFERENT FUELS AND ANALYSIS BASED ON ENTROPY GENERATION.....	631
<i>Souad Morsli, Amina Sabeur, Mohammed El Ganaoui</i>	
SIMULTANEOUS ESTIMATION OF VOLUMETRIC CAPACITY AND THERMAL CONDUCTIVITY OF MOROCCAN WOOD SPECIES FROM EXPERIMENTAL FLASH METHOD.....	639
<i>Mohammed Souihel, Mohammed Garoum, Saad Raefat, Najma Laaroussi</i>	
EARTHQUAKE RISK ASSESSMENT OF BLIDA (ALGERIA) USING GIS	645
<i>Khalida Tadjer, Mahmoud Bensaibi</i>	
INSTANT AUTOVAPORIZATION AS INTENSIFICATION WAY OF CLASSIC DISTILLATION PROCESSES: FUNDAMENTAL AND INDUSTRIAL APPLICATIONS	651
<i>Tassadit Issaadi-Hamitouche, Colette Besombes, Karim Allaf</i>	
STABILITY STUDY OF OUTPUT VOLTAGES OF TWO-STAGE PV SYSTEM BASED THREE LEVELS INVERTER	658
<i>T. Abdelkrim, K. Benamrane, T. Benslimane, O. Abdelkhalek, A. Borni</i>	
EFFECTS OF BUILDING TYPOLOGY ON ENERGY CONSUMPTION IN HOT AND ARID REGIONS.....	664
<i>Islam Tibermacine, Noureddine Zemmouri</i>	

ENERGETIC INVESTIGATION OF A NEW COMBINED ORC-VCC SYSTEM FOR COGENERATION	670
<i>N. Toujeni, N. Bouaziz, L. Kairaouani</i>	
MECHANICAL AND THERMAL CHARACTERIZATION OF STABILIZED EARTH BRICKS	676
<i>Pape Moussa Toure, Vincent Sambou, Mactar Faye, Ababcar Thiam</i>	
NUMERICAL STUDY OF HEAT TRANSFER AND FLOW CHARACTERISTICS OF AIR JET IN A SEMI-CONFINED CAVITY	682
<i>Norbert Tovondrainy, Stéphane Abide, Belkacem Zeghmati, Chrysostôme Raminosoa, Michel Aimé Randriazanamparany</i>	
NATURAL POZZOLANA ADDITION EFFECT ON COMPRESSIVE STRENGTH AND CAPILLARY WATER ABSORPTION OF MORTAR	689
<i>Walid Deboucha, Nordine Leklou, Abdelhafid Khelidj, Mohamed N. Oudjit</i>	
INFLUENCE OF DIFFERENT AMOUNTS OF NATURAL POZZOLAN FROM VOLCANIC SCORIA ON THE RHEOLOGICAL PROPERTIES OF PORTLAND CEMENT PASTES	696
<i>W. H. Juimo Tchamdjou, T. Cherradi, M. L. Abidi, L. A. Pereira De Oliveira</i>	
EFFECT OF THE COLOR OF NATURAL POZZOLAN FROM VOLCANIC SCORIA ON THE RHEOLOGICAL PROPERTIES OF PORTLAND CEMENT PASTES	703
<i>W. H. Juimo Tchamdjou, M. L. Abidi, T. Cherradi, L. A. Pereira De Oliveira</i>	
NUMERICAL INVESTIGATION AND ANALYSIS OF INDOOR AIR QUALITY IN A ROOM BASED ON IMPINGING JET VENTILATION	710
<i>Lounes Koufi, Zohir Younsi, Yassine Cherif, Hassane Naji</i>	
ELECTRICAL PREDICTION OF TORTUOSITY IN POROUS MEDIA	718
<i>Merioua Abderrahmene, Bezzar Abdelillah, Ghomari Fouad</i>	
COMPARISON BETWEEN THE PERMEABILITY WATER AND GAS PERMEABILITY OF THE CONCRETES UNDER THE EFFECT OF TEMPERATURE	725
<i>Mohammed Belhadj Ahlem Houaria, Mahi Abdelkader, Choinska Marta, Khelidj Abdelhafid</i>	
EFFECT OF TUNNEL JUNCTION ON THE INDIUM GALLIUM NITRIDE MULTI-JUNCTION TANDEM SOLAR CELL PERFORMANCES	731
<i>Dennai Benmoussa, H Benslimane, H Khachab</i>	
A COMPARATIVE STUDY ABOUT THE ENERGETIC IMPACT OF DRYLAND RESIDENTIAL BUILDINGS WITH THE INTEGRATION OF PHOTOVOLTAIC SYSTEM	738
<i>Hocine Belahya, Abdelghani Boubekri, Abdelouahed Kriker</i>	
PHASE CHANGE MATERIALS FOR IMPROVING THE BUILDING THERMAL INERTIA	744
<i>Amine Laaouatni, Nadia Martaj, Rachid Bennacer, Mohamed El Omari, Mohammed El Ganaoui</i>	
DYNAMIC SIMULATION OF HYBRID-SOLAR WATER HEATED OLYMPIC SWIMMING POOL	750
<i>K. Kaci, M. Merzouk, N. Kasbadji Merzouk, M. El Ganaoui, S. Sami, R. Djedjig</i>	
MESOSCOPIC STUDY OF NATURAL CONVECTION IN A SQUARE CAVITY FILLED WITH ALUMINA-BASED NANOFLUID	758
<i>Benameur Bouamoud, Samir Houat</i>	
SYNTHESIS, CHARACTERIZATION, ELECTRON PARAMAGNETIC RESONANCE AND UV-VISIBLE STUDY OF PEROVSKITE LAYERED SYSTEM $[NH_3-(CH_2)_8-NH_3]_2CUCL_4$	766
<i>Mahmoud Ettakni, Jaouad Aazza, Fatima Haiki, Abdellah Kaiba, Mostafa Khechoubi</i>	
COMBINED EFFECT OF TEMPERATURE AND SULFATE ATTACK ON THE DURABILITY OF REPAIR MORTAR BASED ON MIXTURE OF DUNE-ALLUVIAL SAND	772
<i>Mohammed Fatah Lakhdari, Ali Zaidi, Mohamed Bouhicha, Benharzallah Krobbi</i>	
MODELING OF SOLAR ENERGY POTENTIAL IN SOUSS-MASSA AREA-MOROCCO, USING INTELLIGENCE ARTIFICIAL NEURAL NETWORKS (ANNS)	778
<i>O. Nait Mensour, B. El Ghazzani, B. Hlimi, A. Ihlal</i>	
NUMERICAL SIMULATION OF FLOW THROUGH A POROUS SQUARE CYLINDER	785
<i>Hamza Mahdhaoui, Xavier Chesneau, Ali Hatem Laatar</i>	
HEAT AND MASS TRANSFER BY NATURAL CONVECTION DURING WATER EVAPORATION IN A VERTICAL CHANNEL WITH PROTUBERANCE	791
<i>Mechergui Oolfa, Xavier Chesneau, Ali Hatem Laatar</i>	
FRP PROPERTIES EFFECT ON NUMERICAL DEFORMATIONS IN FRP BARS-REINFORCED CONCRETE ELEMENTS IN HOT ZONE	798
<i>Ali Zaidi, Mohammed Moulay Brahim, Kaddour Mouattah, Radhouane Masmoudi</i>	
NUMERICAL SIMULATION OF HEAT AND MASS TRANSFERS DURING SOLAR DRYING OF SEWAGE SLUDGE: SOLAR RADIATION EFFECT	804
<i>Nidhal Ben Hassine, Xavier Chesneau, Ali Hatem Laatar</i>	

ENERGY CONSUMPTION REDUCTION IN CONCRETE MIXING PROCESS BY OPTIMIZING MIXING TIME	810
<i>Hai-Thong Ngo, Abdelhak Kaci, El-Hadj Kadri, Tien-Tung Ngo, A. Trudel, Sylvie Lecrux</i>	
CRITICAL DIMENSION OF A CIRCULAR HEAT AND SOLUTE SOURCE FOR AN OPTIMUM TRANSFER WITHIN SQUARE POROUS ENCLOSURES	817
<i>Karim Ragui, Abdelkader Boutra, Rachid Bennacer, Youb Khaled Benkahla</i>	
Author Index	