

FINAL PROGRAMME

International Conference on Science and Technology of Heterogeneous Materials and Structures
Wuhan University

H. Hu, A. J. M. Ferreira (Editors)
11-13 October 2013

Thursday, 10 October 2013

16h00-18h00

Early-Bird Registration GROUND FLOOR, HONGYI HOTEL

Friday, 11 October 2013

07h30

REGISTRATION GROUND FLOOR, HONGYI HOTEL

09h00

OPENING CEREMONY YOURONG HALL, HONGYI HOTEL

09h40 - YOURONG HALL, HONGYI HOTEL

PLENARY TALK **Xi-Qiao Feng**, MECHANICS OF SURFACE WRINKLING OF SOFT MATERIALS

10h20 - 10h50

COFFE BREAK HONGYI HOTEL

10h50 - YOURONG HALL, HONGYI HOTEL

PLENARY TALK **Junuthula N. Reddy**, INCORPORATION OF MATERIAL LENGTH SCALES IN STRUCTURAL THEORIES OF BEAMS AND PLATES

11h30 - YOURONG HALL, HONGYI HOTEL

PLENARY TALK **Erasmus Carrera**, FROM LEKHNITSKII'S WORK TO THE BEST THEORY DIAGRAM: A POSSIBLE STORY ON MODELING OF MULTILAYERED, COMPOSITE STRUCTURES

12h10 - 14h00

LUNCH HONGYI HOTEL

14h00 - YOURONG HALL, HONGYI HOTEL

PLENARY TALK **Hui-Shen Shen**, MODELLING AND ANALYSIS OF FGM STRUCTURES

14h40 - 16h00

PARALLEL SESSIONS

YOURONG HALL: Session1.1 – Mechanics of composite materials and structures at micro- and nano- scales (Chairs: Liao-Liang Ke, Jie Yang)

14h40 (M029), **Hua Yang, Yafang Guo, H. Jerry. Qi**. A MOLECULAR SIMULATION TO INVESTIGATE THE FACTORS INFLUENCING THE KINETICS OF BOND EXCHANGE REACTION IN COVALENT ADAPTABLE NETWORKS POLYMERS.

15h00 (M059), **Chu Xihua, Zhou Lunlun, Xu Yuanjie, Qinghui Jiang**. EVOLUTION OF ANISOTROPY IN GRANULAR MATERIALS: THE EFFECT OF PARTICLE ROLLING AND PARTICLE CRUSHING.

- 15h20 (M041), **Li Mingfa, Zhang Yingxin, Fan Duan, Cheng Nuo**. EXPERIMENTAL STUDY ON GROWTH CHARACTERISTICS OF PCD COMPOSITES.
- 15h40 (M014), **Wen-Ping Wu, Zong-Zhuan Yao**. TEMPERATURE DEPENDENCE OF DEFORMATION TWINNING AND STRESS EVOLUTION AROUND THE CRACK-TIP OF INTERGRANULAR FRACTURE PROCESS IN NICKEL.

ROOM 1: Session 2.1 – Modeling and simulation of heterogeneous materials and structures (Chairs: Gaetano Giunta, Yuanjie Xu)

- 14h40 (M011), **Yin Liu, Hongwu Zhang, Sheng Zhang**. A POSTERIORI ERROR ESTIMATION BASED ADAPTIVE EXTENDED MULTISCALE FINITE ELEMENT METHOD FOR MECHANICAL ANALYSIS OF HETEROGENEOUS MATERIALS.
- 15h00 (M091), **Erasmus Carrera, Alessandro Lamberti, Marco Petrolo**. MIXED AXIOMATIC/ASYMPTOTIC ANALYSES OF REFINED LAYER WISE AND EQUIVALENT SINGLE LAYER PLATE/SHELL MODELS FOR COMPOSITE STRUCTURES.
- 15h20 (M106), **Kun Yu, Qun Huang, Heng Hu, Salim Belouettar, Michel Potier-Ferry**. A NOVEL FOURIER-RELATED DOUBLE SCALE FINITE ELEMENT TO STUDY THE INSTABILITY PHENOMENA OF SANDWICH PLATES.
- 15h40 (M099), **Maria Cinefra, Stefano Valvano, Erasmus Carrera**. DOUBLY-CURVED SHELL FINITE ELEMENTS BASED ON MITC-TYPE TECHNIQUE AND UNIFIED FORMULATION FOR THE ANALYSIS OF MULTILAYERED STRUCTURES.

ROOM 2: Session 3.1 – Advanced heterogeneous materials (Chairs: Salim Belouettar, Yunming Hu)

- 14h40 (Keynote Speech) **David Ruch**.
- 15h10 (M004), **Changcheng Du, Yinghui Li**. ON STRETCHING-BENDING COUPLING OF FGM CIRCULAR PLATES.
- 15h30 (M095), **Georgio Kfoury, Fatima Hassouna, Jean-Marie Raquez, Valérie Toniazzi, David Ruch, Philippe Dubois**. TUNABLE AND DURABLE TOUGHENING OF POLY (LACTIDE) MATERIALS VIA REACTIVE EXTRUSION.
- 15h50 (M070), **Rubing Zhang, Xiangmeng Cheng, Daining Fang, Liaoliang Ke, Yuesheng Wang**. DEVELOPMENT OF A NEW GRADED-POROSITY $ZrO_2(3Y)/Ni$ COMPOSITES BY COLD ISOSTATIC PRESSING AND PRESSURELESS SINTERING.

16h00 - 16h30

COFFEE BREAK HONGYI HOTEL

16h30 - 17h50

PARALLEL SESSIONS

YOURONG HALL: Session 1.2 – Mechanics of composite materials and structures at micro- and nano- scales (Chairs: Liao-Liang Ke, Jie Yang)

16h30 (M077), **Junjie Huang, Mingxiang Chen, Yuan Qi.** MICROMECHANICAL RESPONSE OF GRANULAR GEOMATERIALS SUBJECTED TO EARTHQUAKE GROUND MOTIONS.

16h50 (M009), **W. L. Azoti, A. Tchalla, Y. Koutsawa, A. Makradi, S. Belouettar, H. Zarhouini.** USE OF THE INCREMENTAL MEAN-FIELD FORMULATION FOR CONSTITUTIVE MODELING OF ELASTO-PLASTIC COMPOSITES.

17h10 (M103), **W. L. Azoti, A. Tchalla, Y. Koutsawa, A. Makradi, S. Belouettar.** CONSTITUTIVE MODELING OF ELASTO-PLASTIC COMPOSITES USING MULTI-SITE MICROMECHANICS SCHEME.

ROOM 1: Session 2.2 – Modeling and simulation of heterogeneous materials and structures (Chairs: Gaetano Giunta, Yuanjie Xu)

16h30 (M066), **A. J. M. Ferreira, E. Carrera, M. Cinefra.** A REISSNER-MIXED VARIATIONAL APPROACH FOR THE ANALYSIS OF LAMINATED COMPOSITES USING COLLOCATION WITH RADIAL BASIS FUNCTIONS.

16h50 (M097), **Gaetano Giunta, Salim Belouettar.** ONE-DIMENSIONAL HIERARCHICAL MODELLING OF THREEDIMENSIONAL FUNCTIONALLY GRADED BEAM STRUCTURES.

17h10 (M084), **Wen-zheng Jiang, Ying Liu.** DECOUPLING ANALYTICAL INVESTIGATION OF SANDWICH BEAM UNDER MASS IMPACT.

17h30 (M060), **Yu Cun, Chu Xihua, Xu Yuanjie, Qinghui Jiang.** A STUDY ON THE EFFECTS OF PARTICLES' BREAKAGE BASED ON THE COSSERAT CONTINUUM THEORY.

ROOM 2: Session 3.2 – Advanced heterogeneous materials (Chairs: Salim Belouettar, Yunming Hu)

16h30 (M101), **P. Verge, L. Puchot, T. Fouquet, J. A. S. Bomfim, V. Toniazzo, D. Ruch.** NEW BIO-SURFACTANTS FOR CLAY MODIFICATION: ROLE OF THEIR REACTIVITY ONTO CLAY COMPATIBILIZATION IN EPOXY AND REINFORCING EFFECT.

16h50 (M102), **Yuxin Hao, Wei Zhang.** NONLINEAR FLUTTER BEHAVIOR OF AERO-THERMOELASTIC FGM CYLINDRICAL SHELL.

17h10 (M054), **Yalin Song, Zhongmin Zhao, Long Zhang**. ACHIEVEMENT OF GRAGED COMPOSITE OF TIB2 CERAMIC TO TI ALLOY IN MULTISCALE ANDMULTILEVEL BY REACTIVEPROCESSING IN ULTRAHIGH GRAVITY FIELD.

Saturday, 12 October 2013

08h30 - YOURONG HALL, HONGYI HOTEL

PLENARY TALK **Qing-Ping Sun**, ON SPATIOTEMPORAL HETEROGENEITY IN PHASE TRANSITION BEHAVIOR OF MATERIALS

09h10 - YOURONG HALL, HONGYI HOTEL

PLENARY TALK **Michel Potier-Ferry**, MULTISCALED APPROACHES OF INSTABILITIES

09h50 - 10h10

COFFE BREAK HONGYI HOTEL

10h10 - 11h30

PARALLEL SESSIONS

YOURONG HALL: Session 1.3 – Mechanics of composite materials and structures at micro- and nano- scales (Chairs: Liao-Liang Ke, Wen-Pin Wu)

10h10 (M043), **Lei Zhou, Yafang Guo**. THE MOLECULAR DYNAMICS SIMULATION OF INTERGRANULAR CRACK PROPAGATION IN MAGNESIUM

10h30 (M025), **Dongfeng Cao, Lisheng Liu, Hai Mei and Xin Lai**. STUDY ON THE EVOLUTION OF GEOMETRICALLY NECESSARY DISLOCATION IN PARTICLE-REINFORCED METAL-MATRIX COMPOSITES.

10h50 (M068), **Rui Gao, Yawu Zeng, Xin Du, Yin Chi, Nian Hu, Caiyu Gan**. RESEARCHES ON REFINED MODELING METHOD AND FRICTIONAL MECHANISM OF IRREGULAR SHAPE GRAVEL PARTICLES BASED ON DEM.

11h10 (M023), **Yafang Guo, Shuang Xu, Xiaozhi Tang, Yuesheng Wang**. FROM ATOMISTICS TO REALITY: DEFORMATION MECHANISMS AT THE NANOSCALE IN MAGNESIUM SINGLE CRYSTAL.

ROOM 1: Session 4.1 – Heterogeneous materials and structures in Civil Engineering (Chairs: Rui Gao, Junjie Huang)

10h10 (M081), **Yanshuai Wang, Li Chen, Biqin Dong, Feng Xing**. RENOVATION OF MICRO CRACKING IN CONCRETE STRUCTUREBASED AUTOGENOUS-HEALING MICROCAPSULE SYSTEM.

10h30 (M069), **Nian Hu, Yin Chi, Caiyu Gan, Rui Gao**. NONLINEAR SETTLEMENT OF PILE GROUP IN MULTI-LAYERED SOILS.

10h50 (M104), **Yuehua Chen, Xu Yang, Yabo He, Hongying Li**. FINITE ELEMENT ANALYSIS OF 3D MECHANICAL RESPONSE ON ASPHALT PAVEMENT UNDER DYNAMIC LOAD.

11h10 (M002), **Yubin Lu**. IMPACT BEHAVIOR OF RECYCLED AGGREGATE CONCRETE BASED ON SPLIT HOPKINSON PRESSURE BAR TESTSS.

ROOM 2: Session 3.3 – Advanced heterogeneous materials (Chairs: Frédéric Addiego, Fatima Hassouna)

10h10 (M096), **C. Becker, J. Petersen, T. Fouquet, F. Addiego, V. Toniazzo, A. Diniand D. Ruch**. NANO-ORDERED THIN FILMS ACHIEVED BY SOFT ATMOSPHERICPLASMA POLYMERIZATION.

10h30 (M082), **Li Chen, Yanshuai Wang, Biqin Dong, Feng Xing**. CHARACTERIZATION OF Cl^- ERODING BEHAVIOR IN CEMENTITIOUS MATERIALS USING ELECTROCHEMICAL IMPEDANCE SPECTROSCOPY METHOD.

10h50 (M107), **Qiwen Qiu, Biqin Dong, Jiaqi Xing, Weipeng Yuan, Canjie Huang**. UTILIZATION OF ELECTROCHEMICAL IMPEDANCE SPECTROSCOPY FOR INVESTIGATING THE CARBONATION BEHAVIOR OF MARINE SAND MORTAR.

11h10 (M065), **Jie Yang, Mohammad Rafiee, Sritawat Kitipornchai, LiaoLiang Ke**. THERMAL BUCKLING AND POSTBUCKLING OF PIEZOELECTRIC FGCNTRC MICROBEAMS.

11h40 - 12h40

PARALLEL SESSIONS

YOURONG HALL: Session 2.3 – Modeling and simulation of heterogeneous materials and structures (Chairs: Xihua Chu, Quansheng

Liu)

11h40 (M079), **Etana. A. Ferede, M. M. Abdalla**. ISOGEOMETRIC ANALYSIS OF GEOMETRICALLY NON- LINEAR TIMOSHENKO BEAMS USING QUATERNIONS.

12h00 (M080), **Zheng Yao, Changliang Zheng.** HAMILTON FRAMEWORK AND SYMPLECTIC ALGORITHM OF TWO DIMENSIONAL NONLOCAL LINEAR ELASTICITY.

12h20 (M030), **Quansheng Liu, Jun He, Yuexiu Wu, Jiawang Qu.** A MESHFREE DISCRETE ELEMENT METHOD FOR CRACK PROPAGATION.

12h40 (M022), **Fan Xu, Salim Belouettar, Michel Potier-Ferry, Heng Hu.** SURFACE WRINKLING OF A STIFF THIN FILM ON A FUNCTIONALLY GRADED SUBSTRATE.

ROOM 1: Session 4.2 – Heterogeneous materials and structures in Civil Engineering (Chairs: Ali Daouadji, Yawu Zeng)

11h40 (M015), **Bin Huang, Xu-dong Fu, Han Xu.** EXPANSION MODEL TEST OF EXPANSIVE SOIL IN DIFFERENT STRESS STATE.

12h00 (M005), **Huashan Yang, Yujun Che, Shengjin Tu.** INFLUENCE OF PARTICLE SIZE DISTRIBUTION OF FINE AND MICRO-AGGREGATE ON THE MICROSTRUCTURE OF CEMENT MORTAR AND PASTE.

12h20 (M028), **Lei Jin, Yawu Zeng, Rong Luo.** REFINED SIMULATION AND SHEAR TEST STUDY OF THE EARTH-ROCK AGGREGATE BY PFC^{3D}.

12h40 (M108), **Ali Daouadji and Mohamad Jrad.** UNDRAINED AND DRAINED INSTABILITIES IN GRANULAR MATERIALS

ROOM 2: Session 3.4 – Advanced heterogeneous materials (Chairs: Frédéric Addiego, Fatima Hassouna)

11h40 (M058), **Chen Liu, Liaoliang Ke, YueSheng Wang, Jie Yang, Sritawat Kitipornchai.** FREE VIBRATION OF PIEZOELECTRIC NANOPlates BASED ON THE NONLOCAL THEORY.

12h00 (M027), **Guofeng Du, Zhizhong Zhang.** THE STUDY ON LOCAL UNIFORM CORROSION DAMAGE IDENTIFICATION OF STEEL PIPELINE BASED ON PIEZOELECTRIC CERAMIC.

12h20 (M064), **Jinhua Yang.** NONLINEAR DYNAMIC RESPONSE OF PIEZOELECTRIC PLATE REINFORCED WITH BNNTS UNDER ELECTRO-THERMO-MECHANICAL LOADINGS.

12h40 - 14h00

LUNCH HONGYI HOTEL

14h00 BUS DEPARTURE FROM HONGYI HOTEL TO HUBEI PROVINCIAL MUSEUM

14h15 HUBEI PROVINCIAL MUSEUM

17h10 BUS DEPARTURE FROM HUBEI PROVINCIAL MUSEUM TO HONGYI HOTEL

18h30 BUS DEPARTURE TO HUBEI HUIGUAN

19h00 CONFERENCE DINNER

21h00 BUS DEPARTURE TO HONGYI HOTEL

SUNDAY, 13 October 2013

08h30 - 10h10

PARALLEL SESSIONS

ROOM 1: Session 4.3 – Heterogeneous materials and structures in Civil Engineering (Chairs: Junjie Huang, Xudong Fu)

- 08h30** (M019), **Yijiang Peng, Jiwei Pu, Lijuan Zhang, Nana Dang**. APPLICATION OF BASE FORCE ELEMENT METHOD ON MESO-MECHANICS ANALYSIS FOR RECYCLED AGGREGATE CONCRETE.
- 08h50** (M056), **Cheng-xiang Xu, Guo-feng Du, Chao Ma**. SEISMIC PERFORMANCE OF T-SHAPED CFT COLUMN TO STEEL FRAME BEAM CONNECTION – EXPERIMENTAL STUDY.
- 09h10** (M026), **Lihua Liu, Bin Yang, Di Wu**. RESEARCH ON THE AMENDMENT SKILL OF WATERSTOP'SNONLINEAR SIMULATION CALCULATION BASED ON THE RULEOF TENSOR TRANSFORMATION WITH PARTICLE.
- 09h30** (M105), **Yuehua Chen, Xu Yang, Yabo He**. STUDY ON OPTIMIZATION ON STRUCTURE DESIGN PARAMETERS OF RECTANGULAR FRAME STRUCTURE SUBWAY STATION.

ROOM 2: Session 6.1 – Fracture and damage of heterogeneous materials and structures (Chairs: Yin Chi, Qinghui Jiang)

- 08h30** (M035), **Chi Yao, Qinghui Jiang, Jianfu Shao, Chuangbing Zhou**. NUMERICAL INVESTIGATION OF FAILURE STRENGTH OF SEDIMENTARY ROCKS UNDER BIAXIAL COMPRESSION.
- 08h50** (M039), **Zhiyuan Pan, Jiangtao Zhang, Wuchang She, Pengcheng Zhai**. EXPERIMENT ON THE FATIGUE BEHAVIOR OF BARE OPTICAL FIBER.
- 09h10** (M090), **I. Iturrioz, G. Lacidogna, A. Carpinteri**. ACOUSTIC EMISSION DETECTION IN QUASI-BRITTLE MATERIALS: EXPERIMENTAL ANALYSIS AND SIMULATIONS BY A LATTICE MODEL.
- 09h30** (M040), **Qinghui Jiang, Chi Yao, Wei Wei, Chuangbing Zhou**. A MESO-SCOPIC NUMERICAL MODEL FOR SIMULATION OF STRENGTH AND FAILURE MODES OF ROCK MASS WITH NON-PERSISTENT JOINTS.

09h50 (M036), **Jingdong Jiang, Quansheng Liu, Jie Xu.** RESEARCH ON ELASTOPLASTIC UNLOADING DAMAGE MODEL OF SOFT SOIL.

10h10 - 10h40

COFFE BREAK HONGYI HOTEL

10h40 - 12h20

PARALLEL SESSIONS

ROOM 1: Session 5.1 – Dynamics of heterogeneous structures (Chair: Mohamed El Hachemi)

10h40 (M052), **Xiaofeng Liu, Yuesheng Wang.** THE INVESTIGATION OF LAMB WAVES PROPAGATING IN SANDWICH PHONONIC CRYSTAL PLATES WITH DEFECTS.

11h00 (M093), **Mohamed El Hachemi, Salim Belouettar.** VIBRATION ANALYSIS OF STRUCTURES WITH VISCOELASTIC HETEROGENEITIES.

11h20 (M053), **Zhi-Jie Shi, Yue-Sheng Wang, Chuan-Zeng Zhang.** BAND STRUCTURES CALCULATION OF TWO-DIMENSIONAL FLUID/SOLID PHONONIC CRYSTALS BASED ON GENERALIZED MULTIPOLE TECHNIQUE.

11h40 (M067), **Xiaoli Jia, Shimin Zhang, Shuhai Liu.** FREE VIBRATION OF GEOMETRICALLY NONLINEAR FGMMICRO-BEAMS.

ROOM 2: Session 6.2 – Fracture and damage of heterogeneous materials and structures (Chairs: Yin Chi, Ahmed Makradi)

10h40 (M003), **Qian Shao, Lyazid Bouhala, Anis Younes, Pedro Núñez, Ahmed Makradi.** THERMO-HYDRO-MECHANICAL MODELING OF CRACK PROPAGATION IN POROUS MEDIA USING COMBINED NONCONFORMING FINITE ELEMENT METHOD, DISCONTINUOUS GALERKIN, MULTI-POINT FLUX APPROXIMATION AND EXTENDED FINITE ELEMENT METHODS.

11h00 (M033), **Quansheng Liu, Hao Ma, Zhiping Liu, Jingdong Jiang.** FAILURE MECHANISM OF COMBINED ARCH IN SOFT ROCK WITH BOLT-GROUTING SUPPORT AND A THEORY OF COVERED ARCH.

11h20 (M098), **Frédéric Addiego, Stanislav Patlazhan, Stéphane André, Sigrid Bernstorff, Valérie Toniazzo and David Ruch.** DAMAGE MECHANISMS IN NEAT AND HEMP FIBER-REINFORCED HIGH-DENSITY POLYETHYLENE DURING COMPLEX LOADING HISTORIES IN TENSION REVEALED BY TIME-RESOLVED SMALL-ANGLE X-RAY SCATTERING.

11h40 (M001), **Yin Chi, Lihua Xu, Guodong Mei, Liang Shan.** A UNIFIED FAILURE ENVELOPE FOR HYBRID FIBRE REINFORCED CONCRETE SUBJECTED TO TRUE TRIAXIAL COMPRESSION.

12h00 (M037), **Jie Xu, Quansheng Liu, Yuexiu Wu, Jingdong Jiang.** RESEARCH ON TRIAXIAL UNLOADING TESTS AND ROCK BURST MECHANISM BASED ON DAMAGE MECHANICS.

12h20

LUNCH HONGYI HOTEL