Table of Contents

Plenary lectures

Reinhard **Pippan**, Manuel **Pfeifenberger**, Vladica **Nicolic**, Stefan **Wurster**, Anton **Hohenwarter**, Daniel **Scheiber**, Lorenz **Romaner**
Fracture Toughness of Tungsten: Fracture Mechanism, Experiments, and Simulations 15

Neil **James**, J. M. **Vasco-Olmo**, F. A. **Diaz**, Fernando **Antunes**, Yang **Bing**, Yongfang **Huang**
Characterisation of Fatigue Crack Growth using the CJP Model of Crack Tip Fields or Plastic CTOD 16

Takeshi **Egami**
Deformation Properties of Metallic Glasses 17

Ludvík **Kunz**, Gianni **Nicoletto**, Radomila **Konečná**
Fatigue Properties of Materials Manufactured by Direct Metal Laser Sintering 18

Elias C. **Aifantis**
Nonsingular Gradient and Fractional Fracture Mechanics 19

Section 1: Atomistic studies on deformation and fracture

Takahiro **Shimada**, Takashi **Sumigawa**, Takayuki **Kitamura**, Hiroyuki **Hirakata**
Fracture Criteria for Nanoscale Stress Singularity in Brittle Materials - INVITED 20

Solveig **Melin**, Per **Hansson**, Aylin **Ahadi**
Grain Boundary Influence on the Mechanical Response to Tensile Loading for Nano-sized Cu Beams Modelled by MD Simulations - INVITED 21

Martin **Friák**, Sabina **Oweisová**, Jana **Pavlů**, David **Holec**, Mojmír **Šob**
An ab initio Study of Thermodynamic and Mechanical Stability of Heusler-based Fe2AlCo Polymorphs 22

Larisa **Stepanova**, Sergey **Bronnikov**
A Computational Study of the Mixed–mode Crack Behavior by Molecular Dynamics Method and the Multi-parameter Crack Field Description of Classical Fracture Mechanics 23

Miroslav **Černý**, Petr **Šesták**, Jaroslav **Pokluda**
Atomistic Models of Fracture 24

Roman **Gröger**, Václav **Vitek**
Slip Behavior of Two Interacting 1/2<111> Screw Dislocations in bcc Metals under Uniaxial Load 25

Lukas **Löfler**, Lukas **Hatzenbichler**, Matthias **Bartosik**, David **Holec**
Mechanical Properties and Dislocations in CrN/TiN Superlattices from ab initio Calculations 26

Katsutoshi **Hyodo**, Shinji **Munetoh**, Toshihiro **Tsuchiyama**, Setsuo **Takaki**
Evaluation of Pinning Force on Edge Dislocation due to C and N Atoms in Iron by Molecular Dynamics Simulation 27

Atsushi **Kubo**, Yoshitaka **Umeno**
First-principles Analysis of Deformation and Fracture Properties of Semiconductors 28

Yoshitaka **Umeno**, Atsushi **Kubo**, Jan-Michael **Albina**
Coarse-grained Molecular Dynamics Simulation of Deformation and Fracture in Polycarbonate: Effect of Loading Mode, Strain Rate, Temperature and Molar Mass 29

Martin **Zelený**, Lucie **Bodnárová**, Petr **Sedlák**, Hanuš **Seiner**, Ladislav **Straka**, Oleg **Heczko**, Alexei **Sozinov**, Michal **Landa**
Effect of Doping on Elastic Properties of Alloys Exhibiting Nanotwinning: Theory and Experiment 30

Ying **Chen**, Arkapol **Saengdeejing**
First-principles Analysis of Structure and Stability in RFe12-based Compounds 31

Martin **Friák**, Pavel **Kroupa**, David **Holec**, Mojmír **Šob**
A First-principles Study of Pressure-induced Iso-structural Transition in YN and ScN Characterized by a Reversal in their Elastic Anisotropy 32

Sojiro **Uemura**, Takuya **Yoshida**, Monika **Všianská**, Martin **Friák**, Mojmír **Šob**, Kyosuke **Yoshimi**, Sadahiro **Tsurekawa**
Ab-initio Study of Alloying Effect of Titanium and Carbon on Young's Modulus of Mo5SiB2 (T2) Phase 33

Section 2: Advanced methods for investigation of microstructure and description of fracture processes

John **Campbell**
The Origin of Fractures - INVITED 34

Oleg **Naimark**
Defects Induced Multiscale Kinetics of Damage - Failure Transition under Very High Cycle Fatigue - INVITED 35

Ronan **Madec**
Dislocation Dynamics Simulation of fcc Single Crystals in High Strain Rate Deformation 36

Toshihiro **Tsuchiyama**, Katsuya **Mashima**, Satoshi **Araki**, Setsuo **Takaki**, Takahito **Ohmura**
Evaluation of Hall-Petch Coefficient with Critical Grain Boundary Shear Stress Measured by Nanoindentation in Ferritic Steel 37

Maxim **Artamonov**, Igor **Trunkin**, Alexey **Ovcharov**, Aleksandr **Vasiliev**
The Investigation of the of Fatigue Crack Growth Mechanism in Powder Formation Ni-based Superalloy 38

Dmitry **Erak**, Denis **Zhurko**, Evgenia **Kuleshova**, Valentina **Papina**, Anna **Chernobaeva**, Yaroslav **Shtrombakh**
Forecasting Radiation Embrittlement of VVER-1000 RPV Weld's Metal 39

Yoshikazu **Nakai**, Daiki **Shiozawa**, Shoichi **Kikuchi**, Yuki **Nakagawa**, Kaito **Asayama**
Observations of Twinning and Detwinning in Magnesium Alloy by Synchrotron Radiation DCT and EBSD 40

Lucyna **Domagała**
Resistance of Insulating-structural Concretes to High Temperature 41

Manuel **Carrera Díaz**, Pablo **Lopez-Crespo**, Daniel **Camas**, Yee H **Tai**, John R **Yates**, Thomas **Buslaps**, Philip **Withers**
Plastic Zone Evaluation in a Bainitic Steel Compact Tension Specimen through X-ray Diffraction 42

Robert **Enzinger**, Elisabeth **Hengge**, Wolfgang **Sprengel**, Roland **Würschum**
High-precision Isothermal Dilatometry as a Tool for Quantitative Analysis of Precipitation Kinetics in Dilute Al-Mg-Si Alloys 43

Miroslav **Šmíd**, Efthymios **Polatidis**, Wei-Neng **Hsu**, Helena **Van Swygenhoven**
Multiaxial Loading of Metallic Sheets within Scanning Electron Microscope 44

Section 3: Mathematical modeling microstructure, deformation and fracture

Siegfried **Schmauder**, Marijo **Mlikota**
Physical Fatigue Modelling - INVITED 45

Michal **Kotoul**, Petr **Skalka**, Tomáš **Profant**, Petr **Řehák**, Petr **Šesták**, Miroslav **Černý**, Jaroslav **Pokluda**, Martin **Friák**
Ab-initio Aided Strain Gradient Elasticity Theory - an Efficient Tool in the Fracture Nanomechanics? - INVITED 46

Václav **Paidar**
Two bcc-phases in Refractory High Entropy Alloys 47

Marc **Laub**, Eric **Detemple**, Bastian **Philippi**, Lionel **Germain**, Christian **Motz**
Monte Carlo Simulation of Microstructure Development during Thermo-mechanical Treatment of HSLA Steels 48

Vera **Petrova**, Siegfried **Schmauder**
A Theoretical Model for the Study of Thermal Fracture of Functionally Graded Thermal Barrier Coatings 49

Ivan **Volkov**, Leonid **Igumnov**, Ivan **Modin**, Evgeniy **Boev**
A Damaged Medium Model for Describing a Creep Damage Accumulation Process 50

Atri **Nath**, Sudhirkumar V. **Barai**, Kalyan Kumar **Ray**
A Generalized Model towards Predicting Monotonic and Cyclic Deformation Behavior of Cyclically Stable Materials 51

Ahmed **Azeez**, Robert **Eriksson**, Mattias **Calmunger**, Stefan **Lindström**, Kjell **Simonsson**
Low Cycle Fatigue Modelling of a Steam Turbine Rotor Steel 52

Keng **Jiang**, Alexander **Bezold**, Christoph **Broeckmann**
Numerical Modeling of the Progressive Damage in the Microstructure of WC-Co Hardmetals under Fatigue Loading 53

Oldřich **Ševeček**, Roman **Papšík**, Zdeněk **Majer**, Michal **Kotoul**
Influence of the Cell Geometry on the Tensile Strength of Open-cell Ceramic Foams 54

Filip **Šiška**, Luděk **Stratil**, Andrej **Ostapovec**
Numerical Analysis of Interactions between Twins and Precipitates in hcp Alloys 55

Francesco **Sausto**, Luca **Patriarca**, Stefano **Foletti**, Erica **Vacchieri**
Strain Localizations in Notches for a Coarse-grained Ni-based Superalloy: Simulations and Experiments 56

Viacheslav **Mokryakov**
Maximal Stresses of the Longitudinal Pochhammer-Chree Waves 57

Miroslav **Kureš**
A Characterization of Sliding Vectors by Dual Numbers, Some Dual Curves and the Screw Calculus 58

Hector A **Tinoco**, Carlos Ivan **Cardona**, Tomáš **Vojtek**, Pavel **Hutař**
Finite Element Analysis of Crack-tip Opening Displacement and Plastic Zones Considering the Cyclic Material Behavior 59

Stanislav **Žák**, Reinhard **Pippan**
Crack Tip Plasticity Influence on Cracks Approaching Cu-Si Interface 60

Miroslav **Hrstka**, Michal **Kotoul**, Tomáš **Profant**
Notch Tip Singularities of Elastic Piezoelectric Bi-materials 61

Billel **Boukert**, Amina **Benkhedda**, El Abbes Bedia **Adda**, Mohamed **Khodjet Kesba**
Hygrothermal Stresses Analysis of Thick Composite Plates using High Order Theory under a Fick Concentration Distribution 62

Mohamed **Khodjet Kesba**, Amina **Benkhedda**, Adda Bedia **El Abbes**, Billel **Boukert**
Effect of High Temperature on the Stiffness Properties of Cracked Composite Laminates with Asymmetrical Environmental Conditions 63

Jiří **Vala**, Vladislav **Kozák**
Computational Analysis of Crack Formation and Propagation in Quasi-brittle Fibre Reinforced Composites 64

Pejman **Shayanfard**, Luděk **Heller**, Pavel **Šandera**, Petr **Šittner**
Thermomechanically Transforming Notched NiTi Thin Ribbon: Effect of Martensitic Transformation on Stress and Strain Gradients 65

Section 4: Multiaxial deformation and fracture, experiment and modeling

Aleksander **Karolczuk**, Jan **Papuga**
Recent Progress in Application of Multiaxial Fatigue Criteria to Lifetime Calculations - INVITED 66

Martin **Lederer**, Agnieszka **Betzwar Kotas**, Golta **Khatibi**, Herbert **Danninger**
On Crack Propagation in Homogeneous and Composite Materials under Mixed Mode Loading Conditions 67

Michal **Jedlička**, Václav **Rek**, Jiří **Vala**
On Automation of XFEM Computations Considering General Shapes of Cracks in Terms of the Stress Analysis of Spatial Structures 68

Tomáš **Oplt**, Pavel **Hutař**, Pavel **Pokorný**, Luboš **Náhlík**, Filippo **Berto**
Numerical Evaluation of Plasticity Induced Crack Closure in 3D Structures 69

Ilia **Nikitin**, Nikolay **Burago**, Alexander **Nikitin**, Boris **Stratula**
Study of a Multiaxial Cyclic Loading with Determination of Critical Plane for an Arbitrary Shift of Phases 70

Ondrej **Slávik**, Hector **Navarro**, Jan **Poduška**, Tomáš **Vojtek**, Tomáš **Kruml**, Luboš **Náhlík**, Pavel **Hutař**
Small Crack Propagation in 316L Steel 71

Ilia **Nikitin**, Alexander **Nikitin**, Boris **Stratula**
Constitutive Equations of the Semi-microscopic Theory of Plasticity for a Multiaxial Stress State 72

Lukáš **Trávníček**, Veronika **Mazánová**, Luboš **Náhlík**, Jan **Poduška**, Pavel **Hutař**, Jaroslav **Polák**
Description of Short Fatigue Crack Propagation under Low Cycle Fatigue Regime in Sanicro 25 Steel 73

Ilia **Nikitin**, Nikolay **Burago**, V. **Golubev**, Alexander **Nikitin**
Continual Models of Layered and Block Media with Slippage and Delamination 74

Pavol **Dlhý**, Jan **Poduška**, Pavel **Pokorný**, Luboš **Náhlík**, Rostislav **Fajkoš**, Pavel **Hutař**
Methodology for Estimation of Residual Stresses in Hardened Railway Axle 75

Section 5: Nanomaterials and biomaterials

Gour Prasad **Das**, Amrita **Bhattacharya**, Parul R. **Raghuvanshi**
Phonons and Lattice Thermal Conductivities of Graphene Family - INVITED 76

Ján **Dusza**
Nano-mechanical Characteristics of Advanced Ceramics - INVITED 77

Aleksandar **Sedmak**, Katarina **Čolić**
Fracture and Fatigue Behaviour of Implants Made of Ti Alloys - INVITED 78

Alla **Balueva**, Ilia **Dashevskiy**, Patricia **Todebush**, Chasen **Campbell**
Modeling Binding Energy and Adhesive Strength in Novel Bio-active Nano Coatings on Dental Implants 79

Killang **Pratama**, Francesco **Kunz**, Laura **Lindner**, Jörg **Schmauch**, Frank **Mücklich**, Christian **Motz**
Thermal Stability, Phase Decomposition and Micro-fatigue Properties of Pulsed Electrodeposited Nanocrystalline Co-Cu 80

Xuedong **Zhai**, Zherui **Guo**, Weinong **Chen**
High-speed X-ray Visualization of Bone Fracture 81

Anton **Zhukov**, Boris **Barakhtin**, Ivan **Shakirov**, Vitaliy **Bobyr**, Pavel **Kuznetsov**
The Structure of Iron Powder Aggregation Obtained by Selective Laser Melting 82

Tereza **Kuběnová**, Vít **Vykoukal**, Naděžda **Pizúrová**, Roman **Gröger**
Synthesis and Characterization of Magnetic Iron Oxide Nanoparticles for Bio-applications 83

Jaroslav **Čapek**, Jan **Pinc**, Jiří **Kubásek**, Orsolya **Molnárová**, Jan **Maňák**, Jan **Drahokoupil**
ZnMg0.8Ca/Sr0.2 Ternary Alloys – the Influence of the Third Element on Material Properties 84

Jan **Pinc**, Jaroslav **Čapek**, Jiří **Kubásek**, Petr **Veřtát**, Klára **Hosová**
Microstructure and Mechanical Properties of Potentially Biodegradable Ternary System Zn-Mg0.8-Ca0.2 85

Section 6: Surface and interface microstructure and properties

Mojmír **Šob**, Monika **Všianská**, Martin **Friák**, Hana **Vémolová**, Fan-Shun **Meng**
Structure and Magnetism of Grain Boundaries and Surfaces in Ferromagnetic Metals and Intermetallics - INVITED 86

Zhiliang **Zhang**, Jianying **He**
Design and Fabrication of Super-low Ice Adhesion Surfaces - INVITED 87

Pavel **Lejček**, Monika **Všianská**, Mojmír **Šob**
Recent Achievements and Challenging Drifts in Grain Boundary Segregation - INVITED 88

Thierry **Broult**, Alexandre **Kerlain**, Vincent **Destefanis**, Eric **Le Bourhis**, Gilles **Patriarche**
Properties of CdZnTe and HgCdTe Determined by Indentation 89

Christoph **Skotarek**, Konstantin **Markstaedter**, Angelika **Brueckner-Foit**, Adrian **Rienaecker**
Determination of Crack Initiation in an Interior Cold-weld by Combining Reverse Engineering and Digital Image Correlation Analysis 90

Karel **Slámečka**, David **Jech**, Lenka **Klakurková**, Serhii **Tkachenko**, Michaela **Remešová**, Pavel **Gejdoš**, Ladislav **Čelko**
Thermal Cycling Behaviour of Plasma-sprayed Thermal Barrier Coatings with Pre-oxidized NiCrAlY and NiCoCrAlY Bond-coats 91

Ladislav **Čelko**, David **Jech**, Serhii **Tkachenko**, Pavel **Komarov**, Michaela **Remešová**, Karel **Slámečka**, Pavel **Ctibor**
Failure of Gadolinium Zirconate and Yttria Stabilized Zirconia Thermal Barrier Coatings Subjected to High Temperature Calcia-Magnesia-Alumino-Silicate Attack 92

Martin **Friák**, Martin **Zelený**, Monika **Všianská**, David **Holec**, Mojmír **Šob**
Tensorial Elastic Properties and Stability of Interface States Associated with Sigma5(210) Grain Boundaries in Ni3(Al,Si), ... 93

Barbara **Nasiłowska**, Zdzisław **Bogdanowicz**
Initiation and Development of 1.4539 Austenitic Steel Welded Joints Made with TIG Method and with Laser Beam 94

Lukas **Hatzenbichler**, Rostislav **Daniel**, Walter **Baumegger**, Jozef **Keckes**, David **Holec**
Metallic Superlattices with Naturally Sharp Interfaces: A Case Study of Immiscible Ti-Ta System 95

Nikola **Koutná**, Rainer **Hahn**, Julian **Buchinger**, Martin **Friák**, Matthias **Bartosik**, Mojmír **Šob**, Paul **Mayrhofer**, David **Holec**
Understanding the Relationship between Structural and Mechanical Properties of Metastable Superlattices 96

Martina **Mazalová**, Monika **Všianská**, Jana **Pavlů**, Mojmír **Šob**
Ab initio Study of Vacancies and Impurities on Grain Boundaries in fcc Ni 97

Petr **Šesták**, Martin **Friák**, David **Holec**, Monika **Všianská**, Mojmír **Šob**
Mechanical Properties of Interfaces in Fe-Al Nanocomposites under Complex Multiaxial Loading 98

Monika **Všianská**, Jana **Pavlů**, Mojmír **Šob**
Theoretical Study of Disilicide Nanocomposites with Vacancies and Impurities 99

Jozef **Majerík**, Igor **Barényi**, Maroš **Eckert**
Investigation of Mechanical Properties of Hard Finish Turned and Grinded Surfaces 100

David **Jech**, Ladislav **Čelko**, Michaela **Remešová**, Karel **Slámečka**, Pavel **Ctibor**
Influence of Isothermal Oxidation on Microstructure of YSZ and Mullite-YSZ Thermal Barrier Coatings 101

Section 7: Experimental studies on the relation between microstructure and mechanical properties

Johan **Hoefnagels**, C. **Du**, M. G. D. **Geers**, F. **Maresca**, T. **Vermeij**
Unravelling Micro-plasticity Mechanisms in Martensite, Ferrite, and Dual-phase Steel - INVITED 102

Haruyuki **Inui**, Kyosuke **Kishida**, Kodai **Niitsu**
Single-crystal Mechanical Properties of Equiatomic CrMnFeCoNi High-entropy Alloy and its Derivative Equiatomic Quaternary and Ternary Medium-entropy Alloys - INVITED 103

Jaroslav **Polák**, Roman **Petráš**
Cyclic Plastic Response and Damage in Superaustenitic Steel in High Temperature Cycling with Dwells and in Thermomechanical Cycling 104

Takuro **Masumura**, Yuki **Seto**, Toshihiro **Tsuchiyama**, Setsuo **Takaki**, Ken **Kimura**
Dislocation Strengthening Mechanism in High Nitrogen Austenitic Steel 105

Sascha **Gerbe**, Jochen **Tenkamp**, Steffen **Scherbring**, Kevin **Bleicher**, Ulrich **Krupp**, Wilhelm **Michels**, Frank **Walther**
Microstructural Influences on the Fatigue Crack Initiation and Propagation Mechanisms in Hypo-eutectic Al-Si Cast Alloys 106

Joakim **Nordström**, Raveendra **Siriki**, Mattias **Calmunger**, Johan **Moverare**, Guocai **Chai**
TWIP and Fracture Behavior in a Nickel Base Alloy: At Room Temperature and Below 107

Mattias **Calmunger**, Robert **Eriksson**, Thomas **Lindström**, Daniel **Leidermark**
Effect of Additive Manufacturing on Fatigue Crack Propagation of a Gas Turbine Superalloy 108

Kristián **Máthis**, Daria **Drozdenko**, Jan **Čapek**
Influence of the Solute Concentration on Twinning-detwinning Process in Mg-Al alloys 109

Stanislav **Seitl**, Petr **Miarka**, Jan **Klusák**, Grzegorz **Lesiuk**, Sergio **Blason**, Alfonso **Canteli**
Evaluation of S355 Fatigue Properties Based on Castillo-Canteli et al. Model 110

Ayan **Ray**, Ushasi **Roy**, Mamta **Kumari**, Kalyan Kumar **Ray**
The Role of Substructural Features on the Deformation and Fracture Behavior of bcc and fcc High Entropy Alloys 111

Ahmed **Azeez**, Robert **Eriksson**, Mattias **Calmunger**
Characterisation of Deformation and Damage in a Steam Turbine Steel Subjected to Low Cycle Fatigue 112

Hugo **Wärner**, Robert **Eriksson**, Guocai **Chai**, Johan **Moverare**, Sten **Johansson**, Mattias **Calmunger**
Influence of Ageing on Out-of-phase Thermomechanical Fatigue of Austenitic Stainless Steels 113

Radomila **Konečná**, Gianni **Nicoletto**
On the Link between As-built Surface Quality and Fatigue Behavior of Additively Manufactured Inconel 718 114

Masahiro **Tsukahara**, Yoshitaka **Misaka**
Prevention of Abnormal Grain Growth at Carburizing by Induction Pre-heating 115

Barbara **Nasiłowska**, Paweł **Bogusz**, Wojciech **Skrzeczanowski**
The Influence of Shot Peening on Structure and Mechanical Properties of 5457 Aluminium Alloy Joints Welded with TIG Method 116

Jakub **Holzer**, Zdeněk **Chlup**, Tereza **Kuběnová**, Roman **Gröger**
Slip Activity in High-purity Chromium Single Crystals Compressed at 77 K 117

Sakari **Pallaspuro**, S. Assa **Aravindh**, Wei **Cao**, Pekka **Kantanen**, Mahesh **Somani**, Jukka **Kömi**
Fracture Mechanical Behaviour of 0.3C Direct-quenched and Partitioned Steels 118

Zdeněk **Chlup**, Daniel **Drdlík**, Martin **Fides**, Alexandra **Kovalčíková**, Hynek **Hadraba**
Properties of BaTiO3/Al2O3 Laminate Structure by Nanoindentation 119

Inigo **Bacaicoa**, Martin **Lütje**, F. **Zeismann**, Andreas **Geisert**, Martin **Fehlbier**, Angelika **Brueckner-Foit**
On the Role of Fe-content on the Damage Behavior of an Al-Si-Cu Alloy 120

Luca **Patriarca**, Wael **Abuzaid**
A Study on Sub-grain Strain Heterogeneities at 298K and 77K for the CoCrNi Entropy Alloy 121

Takuro **Masumura**, Setsuo **Takaki**, Toshihiro **Tsuchiyama**
Estimation of the Parameter A in Modified Williamson-Hall Equation for Martensitic Steel 122

Igor **Barényi**, Jozef **Majerík**, Michal **Krbaťa**
Structure Evolution of 33NiCrMoV15 Steel after its Processing by Various Quenching Conditions 123

Petra **Ohnišťová**, Miroslav **Píška**, Jiří **Dluhoš**, Jana **Horníková**, Pavel **Šandera**, Martin **Petrenec**
A Study of Crack Initiation Mechanism in the Aluminum Alloy 7475-T7351 when Tensile Loading 124

Ivo **Černý**, Jan **Kec**, Stanislav **Němeček**, Adam **Poloch**, Marie **Černá**
Fatigue Properties and Damage Mechanisms of Components Manufactured by Laser Additive Welding of H13 on H11 Steels 125

Maciej **Gruszczyński**, Małgorzata **Lenart**
Shrinkage and Strength for Cement Mortars with Addition of Amorphous Aluminum Silicate 126

Luděk **Stratil**, Hynek **Hadraba**, Filip **Šiška**, Zdeněk **Chlup**
Mechanical Properties of the Cantor's High Entropy Alloy with Fine Grain 127
Andrey **Mamonov**, Walentin **Teraud**
The Microstructure Study of the Hydrogenated Titanium Specimens Tested at High Temperature Creep for Long-term Tensile Strength 128
Golta **Khatibi**, Martin **Kirchgassner**
New Method for Evaluating Weld Overlays Exposed to Combined Wear and Dynamic Loads 129
Małgorzata **Lenart**, Maciej **Gruszczyński**
The Research of Mortars Shrinkage Made with Reclaimed Aggregate 130
Aneta **Nowak-Michta**
Impact Analysis of Air-entraining and Superplasticizing Admixtures on Concrete Compressive Strength 131
Petr **Král**, Marie **Kvapilová**, Václav **Sklenička**, Jiří **Zýka**, Josef **Čmakal**, Karel **Hrbáček**
Microstructure and Damage Processes in a Nickel-based Alloy Exposed to Molten Glass 132

Section 8: ESIS TC2 Micromechanisms of fracture and fatigue

Andrey **Jivkov**, Michael **Ford**, Maria **Yankova**
Progress and Challenges with Local Approaches to Cleavage Fracture - INVITED 133
Ivo **Dlouhý**, Peter **Tatarko**, Luca **Bertolla**, Zdeněk **Chlup**
Nano-objects (Nanotubes, Nanosheets): Do They Toughen Brittle Matrices? - INVITED 134
Anton **Hohenwarter**, Simon **Pillmeier**, Reinhard **Pippan**
Fatigue Crack Propagation in Elongated Ultrafine-grained Structures 135
Daniel **Camas**, Fernando **Antunes**, Pablo **Lopez-Crespo**, Antonio **Gonzalez-Herrera**
3D Numerical Study of the Transient Behaviour on Plasticity Induced Crack Closure 136
Patrick **Grünewald**, Florian **Schäfer**, Michael **Marx**, Christian **Motz**
Methodology of Acquiring Fatigue Crack Growth Curves from Micro Bending Beams as a Tool for Investigating Crack-microstructure Interactions 137
Bo-Shiuan **Li**, Ivo **Šulák**, David **Armstrong**, James **Marrow**
Damage Mechanisms in Highly Oriented Pyrolytic Graphite, Studied by High Temperature Nano-indentation 138
Tomáš **Vojtek**, Pavel **Pokorný**, Luboš **Náhlík**, Diego **Herrero**, Pavel **Hutař**
Crack Closure in the Near-threshold Region in Metallic Materials 139
Julian **Buchinger**, Nikola **Koutná**, Zhuo **Chen**, Zaoli **Zhang**, Paul **Mayrhofer**, David **Holec**, Matthias **Bartosik**
Toughness Enhanced Transition Metal Nitride Thin Films 140
Marat **Tyutin**, Lyudmila **Botvina**, Victor **Levin**, Ivan **Sinev**
Interrelation between Mechanical, Physical and Damage Parameters at Fracture of Steels 141
Otmar **Kolednik**, Roland **Kasberger**, Masoud **Sistaninia**
Design of Composites with Improved Fracture Toughness 142
Abhishek **Tiwari**, Johannes **Wiener**, Florian **Arbeiter**, Gerald **Pinter**, Otmar **Kolednik**
Toughness Improvement of Brittle Polymer by Insertion of Soft Interlayers 143

Sergiy **Kotrechko**, Andrei **Timoshevskii**, Eugene **Kolyvoshko**, Yuriy **Matviychuk**, Nataliya **Stetsenko**
Nanodevice Lifetime Prediction – the Challenge for Nano-and Micromechanics 144
Jiaming **Wang**, Andrey **Jivkov**, Q. M. **Li**, Dirk L **Engelberg**
Parametric Study of Cohesive ITZ in Meso-scale Concrete Model 145
Petr **Brož**, Michal **Novák**
Assembling Fracture Mechanics and Fatigue Strength 146
Jan **Poduška**, Pavol **Dlhý**, Pavel **Hutař**, Andreas **Frank**, Jaroslav **Kučera**, Jiří **Sadílek**, Luboš **Náhlík**
Design of Plastic Pipes Considering Content of Recycled Material 147
Andrey **Shanyavskiy**, Michael **Banov**
Durability Diagnostic of Turbine Blades Based on Non-destructive Acoustic Emission Testing 148
Roman **Petráš**, Jaroslav **Polák**
Effects of an Environment in Stainless Steel on the Damage Mechanisms under LCF Conditions 149
Fernando **Antunes**, Michael **Borges**, Bruno **Marques**, Pedro **Prates**, Ricardo **Branco**
Crack Tip Mechanisms: A Numerical Analysis 150
Ulrich **Krupp**, Kevin **Koschellla**, Alexander **Giertler**
The Significance of Grain Size, Segregations and Inclusions for the Very High Cycle Fatigue Fatigue (VHCF) Behavior of Tempered Martensitic Steels 151
Maxim **Artamonov**, Dmitrii **Nemtsev**, Victor **Medentsov**, Valery **Solovyev**
The Influence of Temperature and Stress Cycle Asymmetry at Fatigue Cracks Initiation and Propagation in Cylindrical Specimens of Ni-based Alloy EP741NP 152
Alexander **Eremin**, Sergey **Panin**, Anton **Byakov**, Mikhail **Burkov**, Ramasubbu **Sunder**
DIC-based Investigation of Crack Growth and Fatigue Fracture in Metal Alloys under Static and Cyclic Tension 153
Vít **Horník**, Stanislava **Fintová**, Miroslav **Šmíd**, Pavel **Hutař**, Karel **Hrbáček**, Ludvík **Kunz**
Fatigue Properties of B1914 Superalloy at High Temperatures 154
Vít **Horník**, Stanislava **Fintová**, Miroslav **Šmíd**, Pavel **Hutař**, Karel **Hrbáček**, Ludvík **Kunz**
Interaction of Fatigue and Creep in MAR-M 247 Superalloy 155
Ivo **Šulák**, Jiří **Man**, Karel **Obrtlík**
Mechanism of Fatigue Crack Initiation and Early Propagation in Cyclically Strained Nickel Superalloy 156
Hynek **Lauschmann**, Karel **Tesař**, Kateřina **Jiroušková**
3D Fractography of Fatigue Fractures 157
Andrey **Shanyavskiy**, Alexey **Soldatenkov**
The Fatigue Limit of Metals as a Characteristic of the Multimodal Fatigue Life Distribution for Structural Materials 158
Zdeněk **Antoš**, Petr **Vacek**, Roman **Gröger**
Interaction of Stacking Faults in Zincblende GaN Stabilized by Epitaxial Strain 159

Posters

Nikola **Papež**, Rashid **Dallaev**, Dinara **Sobola**, Robert **Macků**, Pavel **Škarvada**
Microstructural Investigation of Defects in Photovoltaic Cells by the Electron Beam-induced Current Method 160
Rashid **Dallaev**, Nikola **Papež**, Dinara **Sobola**, Shikhgasan **Ramazanov**, Petr **Sedlák**
Investigation of Structure of AlN Thin Films using Fourier-transform Infrared Spectroscopy 161

Dragan **Pustaić**, Martina **Lovrenić-Jugović**
Mathematical Approach of Crack Tip Plasticity 162
Petr **Opěla**, Ivo **Schindler**, Vladivoj **Očenášek**, Petr **Kawulok**, Rostislav **Kawulok**, Stanislav **Rusz**
Modelling the Hot Deformation Behavior of AlSi1MgMn Alloy via Flow Stress Models Utilizing Intelligent Algorithms 163
Zdeněk **Machů**, Zdeněk **Majer**, Zdeněk **Hadaš**, Oldřich **Ševeček**
Crack Propagation Analysis in Multilayer Piezoelectric Energy Harvester 164
Petr **Řehák**, Miroslav **Černý**, Michal **Kotoul**
Determination of Strain Gradient Elasticity Constants 165
Annchristin **Uhl**, Matthias **Thielen**, Michael **Marx**, Christian **Motz**
Influence of the Load Behaviour and Selected Material Properties on the Evolution of the Plastic Zone of Fatigue Cracks by FEM Analysis 166
Tomáš **Profant**, Michal **Kotoul**, Jaroslav **Pokluda**
Prediction of Unstable Fracture of Nanocomponents using ab initio Aided Strain Gradient Elasticity 167
Petr **Kubík**, Jindřich **Petruška**, Petr **Vosynek**, František **Šebek**
Drawbacks of the Lode Dependent Plasticity Model in the Prediction of Deformations under Tension 168
Aleksander **Karolczuk**, Krzysztof **Kluger**, Grzegorz **Robak**
Validation of Multiaxial Fatigue Criteria Application to Lifetime Calculation of S355 Steel under Plane Stress State 169
Ivan **Volkov**, Leonid **Igumnov**, Svetlana **Litvinchuk**, Aleksandr **Boev**
Modeling Fatigue Life of Structural Materials under Block-type Nonsymmetrical Loading 170
Lucie **Malíková**, Leona **Vavro**, Martin **Vavro**, Zbyněk **Keršner**
Evaluation of Fracture Response of Silesian Granite Specimens via Effective Crack Model Approach and Finite Element Analysis 171
Francesco **Kunz**, Louis **Weber**, Christian **Motz**, Tobias **Kraus**
How to Reinforce Pulsed Electrodeposited Nanocrystalline Nickel by Gold Nanoparticles to Improve the Microstructural Stability 172
Libor **Nohal**, Pavel **Mazal**, František **Vlašic**, Marie **Svobodová**
Acoustic Emission Response to Erosion - Corrosion and Creep Damage in Pipeline Systems 173
Alice **Chlupová**, Sergej **Hloch**, Petr **Hlaváček**, Josef **Foldyna**, Tomáš **Kruml**
Interaction of Pulsating Water Jet with Austenitic Steels 174
Miroslav **Luňák**, Ivo **Kusák**
Change in the Sensory Properties of Alkali Activated Slag Mortars 175
Massimo **Rogante**, Joseph **Buhagiar**, Glenn **Cassar**, Matthias **Debono**, Vasily **Lebedev**, Pavol **Mikula**, Vasyl **Ryukhtin**
Neutron Investigation of Nitinol Stents and Massive Samples before and after PIRAC Coating 176
Petr **Haušild**, Jaroslav **Čech**, Václav **Bouček**, Miroslav **Karlík**, Kateřina **Nová**, Filip **Průša**, Pavel **Novák**, Jaromír **Kopeček**
Mechanical Alloying of Fe-Al-Si Intermetallic Compounds using Pure and Pre-alloyed Powders 177
Anna **Hojná**, Michal **Chocholoušek**, Zbyněk **Špirit**, Lucia **Rozumová**
Environmentally Assisted Crack Initiation in Heavy Liquid Metals 178
Aleš **Materna**, Petr **Haušild**, Jan **Ondráček**, Jan **Adámek**, Petra **Petelová**
Effect of Annealing at 700 °C on Hardness of Cold-formed 08Ch18N10T Steel 179

Anna **Hojná**, Mariia **Zimina**, Jaromír **Janoušek**
Effect of High Temperature Water / Vapour Environments and Strain Rate on Crack Initiation of 316L Steel 180

Zdeněk **Chlup**, Martin **Černý**, Martina **Halasová**, Adam **Strachota**
Behaviour of Partially Pyrolysed Composite Reinforced by Fibres of Various Compositions 181

Boris **Gurovich**, Denis **Kuleshov**, Dmitriy **Maltsev**, Oleg **Chugunov**, Alex **Frolov**, Yaroslav **Shtrombakh**
Radiation Degradation Mechanisms of Reactor Graphites Properties 182

Simon A **Sedmak**, Z. **Burzić**, S. **Perković**, R. **Jovičić**, Lj. **Radović**, N. **Ilić**
Determining of Paris Coefficients for Different Regions of a P460Nl1 Steel Welded Joint 183

Ladislav **Poczklán**, Veronika **Mazánová**, Štěpán **Gamanov**, Tomáš **Kruml**
Fatigue Crack Growth Rate in Axial, Torsional and Multiaxial Mode in 316L Austenitic Steel 184

Sergiy **Kotrechko**, Olexandra **Zatsarna**, Vladislav **Kozák**, Ivo **Dlouhý**
Threshold Fracture Stress: Theory and Application. 185

Yoshihiro **Oka**, Toshihiro **Tsuchiyama**, Takuro **Masumura**
Difference in Hall-Petch Coefficient between Carbon- and Nitrogen-added Austenitic Stainless Steels 186

Tomáš **Babinský**, Jaroslav **Polák**
Effective and Internal Stresses in 713LC and Rene 41 Superalloys using Analysis of the Hysteresis Loop Shape 187

Ivan **Sinev**, Marat **Tyutin**, Lyudmila R **Botvina**
The Effect of Stress Concentration and Material Structure on the Kinetics of Damage Accumulation 188