

**The 5th International Conference on
CRACK PATHS (CP 2015)**

Ferrara (Italy), 16 – 18 September, 2015

WEDNESDAY, 16th September, 2015

08.00-08.45 Registration

08.45-09.00 Opening Ceremony - Room Salone d'Onore

09.00-10.00 Plenary Lectures P1 - Room Salone d'Onore

Chairperson: Keisuke TANAKA, Nagoya (Japan)

09.00-09.30 Models of initiation fatigue crack paths proposed by Macha
Zbigniew Marciniak, Dariusz Rozumek (page 17)

09.30-10.00 Local approaches for the fracture assessment of notched components:
the research work developed by Professor Paolo Lazzarin
Filippo Berto (page 18)

10.00-10.30 Refreshment (coffee, drinks, etc.)

10.30-12.30 Parallel Sessions A1, B1 and C1 (see next pages)

12.30-14.00 Lunch

14.00-15.40 Parallel Sessions A2, B2 and C2 (see next pages)

15.40-16.10 Refreshment (coffee, drinks, etc.)

16.10-17.30 Parallel Sessions A3, B3 and C3 (see next pages)

18.30-20.30 Welcome Party at Palazzo Tassoni (Via della Ghiara 36)

PARALLEL SESSION A1 - Room Salone d'Onore

16th September, 2015, time 10.30-12.30

Chairperson: Luca Susmel, Sheffield (UK)

- 10.30 A probabilistic approach to cleavage fracture including constraint and plastic strain effects with application to predict the influence of specimen geometry on elastic-plastic fracture toughness page 28
Claudio Ruggieri, Robert H. Dodds
- 10.50 Effect of segregations on mechanical properties and crack propagation in spring steel 37
B. Žužek, M. Sedlaček, B. Podgornik
- 11.10 Evaluation of near-threshold fatigue crack propagation in Ti-6Al-4V alloy with harmonic structure created by mechanical milling and spark plasma sintering 48
S. Kikuchi, T. Imai, H. Kubozono, Y. Nakai, A. Ueno, K. Ameyama
- 11.30 Kinetics of fatigue crack growth and crack paths in the old puddled steel after 100-years operating time 52
G. Lesiuk, M. Szata
- 11.50 Effect of inhomogeneous distribution of non-metallic inclusions on crack path deflection in G42CrMo4 steel at different loading rates 57
S. Henschel, L. Krüger
- 12.10 Chemistry of grain boundary segregation and embrittlement: recent advances and open problems (only Extended Abstract) 147
Pavel Lejček, Mojmír Šob

PARALLEL SESSION B1 - Room I1

16th September, 2015, time 10.30-12.30

Chairperson: Yoshihiko UEMATSU, Gifu (Japan)

- 10.30 Crack path for run-out specimens in fatigue tests: is it belonging to high- or very-high-cycle fatigue regime? page 41
Andrey Shanyavskiy
- 10.50 Fatigue failure analysis of pin-loaded lugs 104
Slobodanka Boljanović, Stevan Maksimović
- 11.10 Mechanism of crack branching in the fatigue crack growth path of 2324-T39 aluminium alloy 109
Songsong Lu, Rui Bao, Ting Zhang, Binjun Fei
- 11.30 Influence of vacuum carburizing treatment on fatigue crack growth characteristic in DSG2 49
K. Nambu, N. Egami
- 11.50 Fatigue crack growth under remote and local compression - A state-of-the-art review 90
Amir Chahardehi, Ali Mehmanparast
- 12.10 Very high cycle fatigue strength and crack growth of thin steel sheets 107
Mohand Ouarabi, Ruben Perez Mora, Thierry Palin-Luc, Claude Bathias

PARALLEL SESSION C1 - Room I5

16th September, 2015, time 10.30-12.30

Chairperson: Silvio VALENTE, Turin (Italy)

- 10.30 Experimental analysis of crack evolution in concrete by the acoustic emission technique
J. Saliba, A. Loukili, J.P. Regoin, D. Gregoire, L. Verdon, G. Pijaudier-Cabot page 53
- 10.50 Sub-critical cohesive crack propagation with hydro-mechanical coupling and friction
S. Valente, A. Alberto, F. Barpi 113
- 11.10 Static and dynamic experimental study of strengthened reinforced short concrete corbel by using carbon fabrics, crack path in shear zone
Ivelina Ivanova, Jules Assih 29
- 11.30 Modelling of the fracture toughness anisotropy in fiber reinforced concrete
S. Tarasovs, J. Krumiņš, V. Tamužs 105
- 11.50 A non-linear procedure for the numerical analysis of crack development in beams failing in shear
Patrizia Bernardi, Roberto Cerioni, Elena Michelini, Alice Sirico 114
- 12.10 A numerical study of two different specimen fixtures for the modified compact tension test – their influence on concrete fracture parameters
Táňa Holušová, Stanislav Seitl, Hector Cifuentes, Alfonso Fernández-Canteli 137

PARALLEL SESSION A2 - Room Salone d'Onore

16th September, 2015, time 14.00-15.40 - Chairperson: Matteo BENEDETTI, Trento (Italy)

- 14.00 Degenerated graphite nodules influence on fatigue crack paths in a ferritic ductile cast iron
Francesco Iacoviello, Vittorio Di Cocco page 70
- 14.20 Fatigue crack growth behavior of Inconel 718 produced by selective laser melting
R. Konečná, L. Kunz, G. Nicoletto, A. Bača 89
- 14.40 Analysis of cracking of low-alloy copper stretched at elevated temperature
Elżbieta Kalinowska-Ozgowicz, Wojciech Ozgowicz, Klaudiusz Lenik, Aneta Duda 91
- 15.00 Fatigue crack paths and properties in A356-T6 aluminum alloy microstructurally modified by friction stir processing under different conditions
A. Tajiri, Y. Uematsu, T. Kakiuchi, Y. Suzuki 61
- 15.20 EBSD investigation of fatigue crack propagation past a crack closure due to overload
Enrico Salvati, Samuel O'Connor, David Nowell, Alexander M. Korsunsky 95

PARALLEL SESSION B2 - Room I1

16th September, 2015, time 14.00-15.40 - Chairperson: G.M. Domínguez Almaraz, Morelia (Mexico)

- 14.00 Measurement and simulation of crack growth rate and direction under non-proportional loadings
Y. Hos, M. Vormwald page 34
- 14.20 Multiaxial fatigue crack path prediction using critical plane concept
Jafar Albinmousa 145
- 14.40 Crack growth threshold under hold time conditions in DA Inconel 718 - A transition in the crack growth mechanism
E. Fessler, S. Pierret, E. Andrieu, V. Bonnard 119
- 15.00 Paths of interactive cracks in creep conditions
Krzysztof Nowak 108
- 15.20 The influence of an axial pre-stress on the fatigue limit (only Extended Abstract)
Vinko Močilnik, Nenad Gubelj, Jožef Predan 151

PARALLEL SESSION C2 - Room I5

16th September, 2015, time 14.00-15.40 - Chairperson: Ali Osman AYHAN, Serdivan (Turkey)

- 14.00 Fatigue crack propagation in short-fiber reinforced plastics
Keisuke Tanaka, Kazuya Ohrada, Daiki Yamada, Kenichi Shimizu page 55
- 14.20 Analytical model of asymmetrical Mixed-Mode Bending test of adhesively bonded GFRP joint
M. Ševčík, A.P. Vassilopoulos, M. Shahverdi, P. Hutař 43
- 14.40 Investigation of crack paths in natural fibre-reinforced composites
S. Keck, M. Fulland 64
- 15.00 Estimation of stepwise crack propagation in ceramic laminates with strong interfaces
L. Náhlík, K. Štegnerová, P. Hutař 32
- 15.20 Understanding the edge crack phenomenon in ceramic laminates
Oldřich Ševeček, Michal Kotoul, Dominique Leguillon, Eric Martin, Raul Bermejo 63

PARALLEL SESSION A3 - Room Salone d'Onore

16th September, 2015, time 16.10-17.30 - Chairperson: Filippo BERTO, Padua (Italy)

- 16.10 Microstructure dependence of fatigue crack propagation behavior in wrought magnesium alloy
Shigeki Morita, Seiya Fujiwara, Takahito Hori, Nobusuke Hattori, Hidetoshi Somekawa, Tsuyoshi Mayama page 110
- 16.30 Crack path in liquid metal embrittlement : experiments with steels and modeling
Thierry Auger, Samuel Hémerly, M. Bourcier, C. Berdin, May Martin, Ian Robertson 120
- 16.50 Plasma-sprayed thermal barrier coatings: numerical study on damage localization and evolution
K. Slámečka, P. Skalka, L. Čelko, J. Pokluda, L. Saucedo-Mora, T.J. Marrow, U. Thandavamoorthy 131
- 17.10 Life estimation by varying the critical plane orientation in the modified Carpinteri-Spagnoli criterion 25
Camilla Ronchei, A.Carpinteri, G.Fortese, M.Kurek, T.Łagoda, A.Spagnoli, S.Vantadori

PARALLEL SESSION B3 - Room I1

16th September, 2015, time 16.10-17.30 - Chairperson: Yury G. MATVIENKO, Moscow (Russia)

- 16.10 Fatigue crack micromechanisms in a Cu-Zn-Al shape memory alloy with pseudo-elastic behavior
Vittorio Di Cocco, Francesco Iacoviello, Stefano Natali, Andrea Brotzu page 71
- 16.30 In-situ observation of rolling contact fatigue cracks by laminography using ultrabright synchrotron radiation
Y. Nakai, D. Shiozawa, S. Kikuchi, K. Sato, T. Obama, T. Makino, Y. Neishi 46
- 16.50 Effect of defect length on rolling contact fatigue crack propagation in high strength steel
Taizo Makino, Yutaka Neishi, Daiki Shiozawa, Shoichi Kikuchi, Souta Okada, Kentaro Kajiwara, Yoshikazu Nakai 59
- 17.10 Lubricating fluid pressurization and entrapment in inclined edge cracks under rolling-sliding contact fatigue
M. Benedetti, S. Ancellotti, M. Dallago, V. Fontanari, M. Beghini 65

PARALLEL SESSION C3 - Room I5

16th September, 2015, time 16.10-17.30 - Chairperson: Masanori KIKUCHI, Noda (Japan)

- 16.10 Relation between the plastic instability and fracture of tensile tested Cu-Sn alloys investigated with the application of acoustic emission technique
Wojciech Ozgowicz, Barbara Grzegorzcyk, Andrzej Pawelek, Wojciech Wajda, Wojciech Skuza, Andrzej Piątkowski, Zbigniew Ranachowski page 83
- 16.30 Mechanisms of plastic instability and fracture of compressed and tensile tested Mg-Li alloys investigated using the acoustic emission method
A. Pawelek, A. Piątkowski, W. Wajda, W. Skuza, A. Tarasek, W. Ozgowicz, B. Grzegorzcyk, Zbigniew Ranachowski, S. Kúdela Jr., S. Kúdela 84
- 16.50 Crack detection and safety evaluation of railway bogie frame after long term running
Seok-Jin Kwon, Jung-Won Seo, Dong-Hyung Lee, Hyun-Kyu Jun 75
- 17.10 Identification of crack paths and loading parameters in plate structures by solving inverse elastic boundary value problems
Ramdane Boukellif, Andreas Ricoeur 54

THURSDAY, 17th September, 2015

09.30-10.00 Plenary Lecture P2 - Room Salone d'Onore

Chairperson: Michael VORMWALD, Darmstadt (Germany)

09.30-10.00 Crack paths in smooth and precracked specimens subjected to multiaxial cyclic stressing
Nicholas R. Gates, Ali Fatemi (page 19)

10.00-10.30 Refreshment (coffee, drinks, etc.)

10.30-12.30 Parallel Sessions A4, B4 and C4 (see next pages)

12.30-14.00 Lunch

14.00-15.40 Parallel Sessions A5, B5 and C5 (see next pages)

15.40-16.10 Refreshment (coffee, drinks, etc.)

16.10-17.10 Parallel Sessions A6, B6 and C6 (see next pages)

Palazzo Costabili (Via XX Settembre 122) :

19.00-20.00 Free visit to Ferrara National Archaeological Museum

20.00-20.45 Performance of the Bal'danza Ensemble: 'O Triumphale Diamante'

20.45-23.00 Conference Dinner

PARALLEL SESSION A4 - Room Salone d'Onore

17th September, 2015, time 10.30-12.30

Chairperson: Guido DHONDT, Munich (Germany)

- 10.30 Crack initiation at V-notch tip subjected to in-plane mixed mode loading:
An application of the fictitious notch rounding concept page 38
F. Berto
- 10.50 The study of a defect evolution in iron under fatigue loading in gigacyclic fatigue regime 121
O. Plekhov, O. Naimark, M. Narykova, A. Kadomtsev, V. Betehtin
- 11.10 Crack path in aeronautical titanium alloy under ultrasonic torsion loading 132
A.D. Nikitin, T. Palin-Luc, A.A. Shanyavskiy, C. Bathias
- 11.30 A unified approach for static and dynamic fracture failure in solids and granular materials by a particle method 26
Roberto Brighenti, Andrea Carpinteri, Nicholas Corbari
- 11.50 Crack path predictions and experiments in plane structures considering anisotropic properties and material interfaces 42
P.O. Judt, A. Ricoeur
- 12.10 Crack path & fracture surface modifications in cement composites 102
S. Ahmad, J.M. Tulliani, G.A. Ferro, R.A. Khushnood, L. Restuccia, P. Jagdale

PARALLEL SESSION B4 - Room I1

17th September, 2015, time 10.30-12.30

Chairperson: Francesco IACOVIELLO, Cassino (Italy)

- 10.30 Fatigue cracking of aluminium alloy AlZn6Mg0,8Zr subjected to thermomechanical treatment page 92
A. Kowalski, W. Ozigowicz, M. Kurek, A. Kurek, T. Łagoda
- 10.50 Critical crack path assessments in failure investigations 33
Robert D. Caligiuri
- 11.10 Improvement of adhesion performance of mortar-repair interface with inducing crack path into repair 68
A. Satoh, M. Satoh, K. Yamada
- 11.30 Experimental investigation of crack initiation and propagation in high- and gigacycle fatigue in titanium alloys by study of morphology of fracture 96
Mikhail Bannikov, Oleg Naimark, Vladimir Oborin
- 11.50 Crack initiation and fracture features of Fe–Co–B–Si–Nb bulk metallic glass during compression 101
S. Lesz, A. Januszka, S. Griner, R. Nowosielski
- 12.10 EBSD-assisted fractographic analysis of crack paths in magnesium alloy 62
S. Takaya, Y. Uematsu, T. Kakiuchi, M. Nakajima

PARALLEL SESSION C4 - Room I5

17th September, 2015, time 10.30-12.30

Chairperson: Giovanni MENEGHETTI, Padua (Italy)

- | | | |
|-------|---|---------|
| 10.30 | Influence of local stress concentrations on the crack propagation in complex welded components
Claas Fischer, <u>Wolfgang Fricke</u> | page 30 |
| 10.50 | Welding sequence effects on residual stress distribution in offshore wind monopile structures
<u>Ali Mehmanparast</u> , Oyewole Adedipe, Amir Chahardehi, Feargal Brennan | 118 |
| 11.10 | Fatigue properties and fracture mechanism of load carrying type fillet joints with one-sided welding
<u>Takamasa Abe</u> , Hiroyuki Akebono, Masahiko Kato, Atsushi Sugeta | 124 |
| 11.30 | Fatigue crack growth and arrest under high cycle thermal loading using XFEM in presence of weld residual stresses
<u>Said Taheri</u> , Emricka Julan, Van-Xuan Tran | 126 |
| 11.50 | Modelling of ultrasonic impact treatment (UIT) of welded joints and its effect on fatigue strength
<u>Kui Lin Yuan</u> , Yoichi Sumi | 80 |
| 12.10 | Fatigue crack growth prediction in 2xxx AA friction stir weld HAZ properties
A. Tzamtzis, <u>A.T. Kermanidis</u> | 97 |

PARALLEL SESSION A5 - Room Salone d'Onore

17th September, 2015, time 14.00-15.40 - Chairperson: Yoichi SUMI, Yokohama (Japan)

- 14.00 Unguided crack path prediction by using peridynamics
Erdogan Madenci, K. Colavito, Nam Phan page 51
- 14.20 Multiple and non-planar crack propagation analyses in thin structures using FCPAS
H. DüNDAR, A.O. Ayhan 142
- 14.40 Investigation of mixed mode-I/II fracture problems - Part 1 : Computational and
experimental analyses
O. Demir, S. İriç, A.O. Ayhan, H. Lekesiz 139
- 15.00 Investigation of mixed mode-I/II fracture problems - Part 2 : Evaluation and
development of mixed mode-I/II fracture criteria
O. Demir, A.O. Ayhan 140
- 15.20 Finite element modeling and experimental studies on mixed mode-I/III fracture
specimens
M. Bozkurt, A.O. Ayhan, M.F. Yaren, S. İriç 141

PARALLEL SESSION B5 - Room I1

17th September, 2015, time 14.00-15.40 - Chairperson: Vittorio DI COCCO, Cassino (Italy)

- 14.00 Crack initiation characteristics and fatigue property of a high-strength steel in
VHCF regime under different stress ratios
Xiaolong Liu, Chengqi Sun, Youshi Hong page 111
- 14.20 Controlling fatigue crack paths for crack surface marking and growth investigations
S. Barter, M. Burchill, P. White 122
- 14.40 Growth behavior of fatigue cracks in ultrafine grained Cu smooth specimens
with a small hole
Masahiro Goto, Kakeru Morita, Junichi Kitamura, Takaei Yamamoto, Masataka
Baba, Seung-zeon Han, Sangshik Kim 73
- 15.00 Crack initiation and early propagation plane orientation of 2A12-T4 aluminum
alloy under tension-torsion fatigue loading including mean tensile stress
Xinhong Shi, Jianyu Zhang, Qingshan Xiao, Tianqi Liu 112
- 15.20 Influence of operation factors on brittle fracture initiation and critical local cleavage
stress in VVER pressure vessel steel specimens of SE(B) type
E.A. Kuleshova, B.A. Gurovich, A.D. Erak, D.A. Maltsev, D.A. Zhurko, 149
A.P. Bandura, S.A. Bubyakin (only Extended Abstract)

PARALLEL SESSION C5 - Room I5

17th September, 2015, time 14.00-15.40 - Chairperson: Takamoto ITOH, Shiga (Japan)

- 14.00 Influence of joint line remnant on crack paths under static and fatigue loadings in friction stir welded Al-Mg-Sc alloy
Yasuko Besel, Michael Besel, Ulises Alfaro Mercado, Toshifumi Kakiuchi, Yoshihiko Uematsu page 128
- 14.20 Effect of additive elements and aging on crack initiation and propagation behavior for Sn-Bi solders
Noritake Hiyoshi, Mitsuo Yamashita, Yasuaki Watanabe 138
- 14.40 Crack initiation and propagation paths in FSW tubes under fatigue loading
Roberto Tovo, Luca Susmel, Neil James, Danie Hattingh, Enrico Maggiolini 144
- 15.00 Crack growth behavior of aluminum alloy 6061 T651 under uniaxial and biaxial planar testing condition
Sebastian Henkel, Esther Liebelt, Horst Biermann, Stephanie Ackermann, Lutz Zybell 78
- 15.20 Modified fracture properties of cement composites with nano/micro carbonized bagasse fibers
R.A. Khushnood, S. Ahmad, G.A. Ferro, L. Restuccia, J.M. Tulliani, P. Jagdale 117

PARALLEL SESSION A6 - Room Salone d'Onore

17th September, 2015, time 16.10-17.10

Chairperson: Valery SHLYANNIKOV, Kazan (Russia)

- 16.10 Prediction of three-dimensional crack propagation paths taking high cycle fatigue into account
Guido Dhondt page 115
- 16.30 Surface crack growth subject to bending and biaxial tension-compression
V. Shlyannikov, A. Tumanov, A. Zakharov, A. Gerasimenko 116
- 16.50 Implementation of a damage model in a finite element program for computation of structures under dynamic loading
Nasserline Oudni, Youcef Bouafia 125

PARALLEL SESSION B6 - Room I1

17th September, 2015, time 16.10-17.10

Chairperson: Andrey SHANYAVSKIY, Moscow (Russia)

- 16.10 Orientation of propagating crack paths emanating from fretting-fatigue contact problems
Eugenio Giner, José Díaz-Alvarez, Miguel Marco page 134
- 16.30 Fretting fatigue crack propagation rate under variable loading conditions
C. Gandiolle, S. Fouvry 106
- 16.50 Delamination cracking effects on fracture toughness behavior of 14YWT nanostructured ferritic alloys (NFA)
Claudio Ruggieri, G. Robert Odette 27

PARALLEL SESSION C6 - Room I5

17th September, 2015, time 16.10-17.10

Chairperson: Masahiro GOTO, Oita (Japan)

- 16.10 Effects of large amounts of hydrogen on the fatigue crack growth behavior of torsional prestrained carbon steel
Yuta Matsuda, Hiroshi Nishiguchi, Takayuki Fukuda page 58
- 16.30 A cohesive zone model to simulate the hydrogen embrittlement effect on a high-strength steel
Giorgia Gobbi, Chiara Colombo, Laura Vergani 93
- 16.50 Evolution of fracture mode for varying grain sizes in a hydrogen-charged metastable austenitic steel (only Extended Abstract)
Arnaud Macadre, Nobuo Nakada, Toshihiro Tsuchiyama, Setsuo Takaki 152

FRIDAY 18th September, 2015

09.30-10.00 Plenary Lecture P3 - Room Salone d'Onore

Chairperson: Youshi HONG, Beijing (China)

09.30-10.00 Fracture morphology and its evolution - A review on crack path stability and brittle fracture along butt-weld
Yoichi Sumi (page 20)

10.00-10.30 Refreshment (coffee, drinks, etc.)

10.30-12.30 Parallel Sessions A7, B7 and C7 (see next pages)

12.30-14.00 Lunch

14.00-16.00 Parallel Sessions A8, B8 and C8 (see next pages)

16.10-16.30 Closing Ceremony - Room Salone d'Onore

PARALLEL SESSION A7 - Room Salone d'Onore

18th September, 2015, time 10.30-12.30

Chairperson: Markus FULLAND, Zittau (Germany)

10.30	Evolution of crack aspect ratio in sheets subjected to fatigue <u>J. Toribio</u> , J.C. Matos, B. González	page 143
10.50	DBEM crack propagation for nonlinear fracture problems <u>R. Citarella</u> , V. Giannella, P. Di Lascio, M. Lepore	133
11.10	Applications of lattice method in the simulation of crack path in heterogeneous materials L.E. Kostascki, F.S. Soares, <u>I. Iturrioz</u>	44
11.30	Modelling 3D crack propagation in ageing graphite bricks of Advanced Gas-cooled Reactor power plant T.-T.-G. Vo, P. Martinuzzi, <u>V.-X. Tran</u> , N. McLachlan, A. Steer	45
11.50	A numerical study of crack paths using finite element granular mesh structures <u>Anais Jacob</u> , Ali Mehmanparast, Athanasios Kolios (only Extended Abstract)	148
12.10	Influence of initial residual stresses on crack path prediction with the eXtended Finite Element Method (only Extended Abstract) <u>Olivier Pierard</u> , Benoît Dompierre, Eric Wyart	150

PARALLEL SESSION B7 - Room I1

18th September, 2015, time 10.30-12.30

Chairperson: Thierry PALIN-LUC, Talence (France)

10.30	Development of in-situ fatigue crack observing system for rotating bending fatigue testing machine B. Lian, <u>A. Ueno</u> , T. Iwashita	page 103
10.50	Experimental study of heat dissipation at the crack tip during fatigue crack propagation <u>A. Vshivkov</u> , A. Iziumova, O. Plekhov, J. Bär	98
11.10	Combined lock-in thermography and heat flow measurements for analysing heat dissipation during fatigue crack propagation <u>J. Bär</u> , A. Vshivkov, O. Plekhov	77
11.30	Experimental estimation of the heat energy dissipated in a volume surrounding the tip of a fatigue crack G. Meneghetti, <u>M. Ricotta</u>	136
11.50	New experimental techniques for fracture testing of highly deformable materials E. Dall'Asta, <u>V. Ghizzardi</u> , R. Brighenti, E. Romeo, R. Roncella, A. Spagnoli	135
12.10	Fatigue characterization of a crankshaft steel: Use and interaction of new models <u>Sergio Blasón</u> , Cristina Rodríguez, Alfonso Fernández-Canteli	146

PARALLEL SESSION C7 - Room I5

18th September, 2015, time 10.30-12.30

Chairperson: Liviu MARSAVINA, Timisoara (Romania)

- 10.30 Crack mode and life of Ti-6Al-4V under multiaxial low cycle fatigue
Takamoto Itoh, Takahiro Morishita, Masao Sakane, Hiroshi Nakamura,
Masahiro Takanashi page 82
- 10.50 Effect of rare earth content on fatigue strength of spheroidal graphite cast iron
Kaito Todate, Kazumichi Shimizu, Takafumi Funabiki, Kenta Kusumoto,
Shinsuke Nagaumi 87
- 11.10 Multiscale study of fracture in aluminum-magnesium alloy under fatigue and
dynamic loading 72
Vladimir Oborin, Mikhail Bannikov, Oleg Naimark, Mikhail Sokovikov, Dmitry Bilalov
- 11.30 High temperature fatigue tests and cracks growth in 40CrMoV13.9 notched components
P. Gallo, F. Berto 39
- 11.50 Influence of control parameters on the crack paths in the aluminum alloy 2024
under bending
Ewa Marcisz, Dariusz Rozumek, Zbigniew Marciniak 66
- 12.10 Fatigue life prediction of pedicle screw for spinal surgery
Š. Major, V. Kocour 94

PARALLEL SESSION A8 - Room Salone d'Onore

18th September, 2015, time 14.00-16.00

Chairperson: Jesús TORIBIO, Zamora (Spain)

14.00	Crack paths and the linear elastic analysis of cracked bodies Les P. Pook (speaker: <u>F. Berto</u>)	page 36
14.20	Three-dimensional effects on cracked discs and plates under nominal Mode III loading <u>A. Campagnolo</u> , F. Berto, L.P. Pook	40
14.40	Numerical analysis of various equivalences of an individual surface crack with periodically distributed surface cracks <u>Byunghyun Kang</u> , Byoung-Ho Choi	88
15.00	A link between the peak stresses and the averaged strain energy density for cracks under mixed-mode (I+II) loading <u>Giovanni Meneghetti</u> , Alberto Campagnolo, Filippo Berto, Bruno Atzori	31
15.20	The concept of the average stress in the fracture process zone for the search of the crack path <u>Yu.G. Matvienko</u> , M.M. Semenova	47
15.40	Effects of microstructure and crystallography on crack path and intrinsic resistance to shear-mode fatigue crack growth J. Pokluda, <u>T. Vojtek</u> , A. Hohenwarter, R. Pippan	35

PARALLEL SESSION B8 - Room I1

18th September, 2015, time 14.00-16.00

Chairperson: Ali FATEMI, Toledo (USA)

14.00	On the crack path under mixed mode loading on PUR foams <u>Liviu Marsavina</u> , Emanoil Linul, Tudor Voiconi, Dan M. Constantinescu, Dragos A. Apostol	page 67
14.20	Crack initiation and propagation on the polymeric material ABS (Acrylonitrile Butadiene Styrene), under ultrasonic fatigue testing <u>G.M. Domínguez Almaraz</u> , E. Correa Gómez, J.C. Verduzco Juárez, J.L. Ávila Ambriz	86
14.40	Numerical study of crack path by MMCG specimen using M integral S. El Kabir, <u>R. Moutou Pitti</u> , N. Recho, Y. Lapusta, F. Dubois	99
15.00	Fatigue crack initiation and propagation in lotus-type porous material S. Glodež, S. Dervarič, <u>M. Šraml</u> , J. Kramberger	130
15.20	Damage and failure modeling of lotus-type porous material subjected to low-cycle fatigue <u>J. Kramberger</u> , K. Sterkuš, S. Glodež	129
15.40	Investigation of Mode I fracture toughness of red Verona marble after thermal treatment <u>Daniela Scorza</u> , Andrea Carpinteri, Giovanni Fortese, Sabrina Vantadori, Daniele Ferretti, Roberto Brighenti	24

PARALLEL SESSION C8 - Room I5

18th September, 2015, time 14.00-16.00

Chairperson: Eugenio GINER, Valencia (Spain)

14.00	Crack growth simulation in heterogeneous material by S-FEM and comparison with experiments <u>Masanori Kikuchi</u> , Yoshitaka Wada, Yulong Li	page 56
14.20	Graphene as a model system for 2D fracture behavior of perfect and defective solids <u>Peter Hess</u>	60
14.40	Effect of centrifugal load on crack path in thin-rimmed and webbed gears Francesca Curà, <u>Andrea Mura</u> , Carlo Rosso	76
15.00	Crack propagation in fracture mechanical graded structures <u>B. Schramm</u> , H.A. Richard	50
15.20	Fatigue crack growth in additive manufactured products Andre Riemer, Hans Albert Richard, <u>Jan-Peter Brüggemann</u> , Jan-Niklas Wesendahl	74
15.40	Fatigue crack paths in a low-carbon steel. Modelling of fatigue behaviour Donka Angelova, Rozina Yordanova, <u>Svetla Yankova</u>	100

16.10-16.30 Closing Ceremony - Room Salone d'Onore