Program

Nanomechanical Testing in Materials Research and Development VI

October 1 - 6, 2017
Dubrovnik, Croatia

Conference Chair
Karsten Durst
Technical University Darmstadt
Germany
Sun Gardens Dubrovnik
Na Moru 1,
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October 9 – 15, 2005
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Nanomechanical Testing in Materials Research & Development II
October 11 - 16, 2009
Barga, Italy
Conference Chair:
Mathias Göken, University Erlangen-Nurnberg, Germany

Nanomechanical Testing in Materials Research & Development III
October 9 – 14, 2011
Lanzarote, Canary Islands, Spain
Conference Chair:
Gerhard Dehm, University of Leoben, Austria

Nanomechanical Testing in Materials Research & Development IV
October 6 - 11, 2013
Albufeira, Portugal
Conference Chair:
Johann Michler, EMPA, Switzerland

Nanomechanical Testing in Materials Research & Development V
October 4-9, 2015
Albufeira, Portugal
Conference Chair:
Marc Legros, CEMES-CNRS, France
Conference Sponsors

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NOTES

- Technical Sessions and the Tutorial Session will be in Soderini 3 (Level R). Poster sessions will be in Giardino (Level 0).

- Dinners will be in Giardino. Lunches on Monday and Wednesday will be in the Origano Restaurant. Lunch on Thursday will be in Giardino.

- Audio, still photo and video recording by any device (e.g., cameras, cell phones, laptops, PDAs, watches) is strictly prohibited during the technical sessions, unless prior permission has been granted by the author and ECI.

- Speakers – Please have your presentation loaded onto the conference computer prior to the session start (preferably the day before).

- Speakers – Please leave at least 3-5 minutes for questions and discussion.

- Please do not smoke at any conference functions.

- Turn your mobile telephones to vibrate or off during technical sessions.

- Please write your name on your program so that it can be returned to you if lost or misplaced.

- After the conference, ECI will send an updated participant list to all participants. Please check your listing now and if it needs updating, you may correct it at any time by logging into your ECI account.
Sunday, October 1, 2017

08:30 - 09:00  Check-in for Optional Tutorial Session
09:00 - 13:00  Tutorial Session

Advances in high temperature nanoindentation
Jeff Wheeler, ETH Zurich, Switzerland

Analysis of thermally activated processes during indentation
Verena Maier-Kiener, Montanuniversität Leoben, Austria

Industrial application of small scale mechanical testing
Johann Michler, EMPA, Switzerland

13:00 - 14:00  Lunch (on your own)
14:00 - 15:45  Conference check-in (Pre-function area)
15:45 - 16:00  Welcome and Conference Overview
Conference Chair: Karsten Durst
ECI Technical Liaison: Larry Kabacoff

16:00 - 17:00  Keynote: Integrated experimental and simulation analysis of stress and strain partitioning in dual phase steel
Dierk Raabe
Max-Planck-Institut für Eisenforschung GmbH, Düsseldorf, Germany

17:00 - 19:00  Session I: Introducing nanomechanical testing in research and development

17:00 - 17:30  Highlight: Quantifying the commonalities in structure and plastic deformation in disordered materials
Daniel S. Gianola, University of California, Santa Barbara, USA

17:30 - 17:50  Plastic deformation of sub-micron Al and Be wires: A TEM and in situ TEM study
Marc Legros, CEMES-CNRS, Toulouse, France

17:50 - 18:10  The brittle-ductile transition of tungsten single crystals at the micro-scale
Johannes Ast, EMPA Swiss Federal Laboratories for Materials Science and Technology, Switzerland

19:00 - 20:00  Welcome Reception
20:00 - 21:30  Dinner (Giardino)
Monday, October 2, 2017

07:30 - 09:00  Breakfast Buffet

09:00 - 13:00  Session II: Small scale fracture mechanics

09:00 - 09:40  Invited
Fracture mechanics of microsamples
Reinhard Pippan, Erich Schmid Institute of Materials Science of the Austrian Academy of Sciences, Austria

09:40 - 10:00  In situ HR-EBSD during micro-mechanical testing for microstructure, stress and plastic deformation characterizations in material
Xavier Maeder, EMPA - Swiss Federal Laboratories for Materials Science and Technology, Switzerland

10:00 - 10:20  Micromechanics of fully lamellar TiAl alloys
Jon Molina-Aldareguia, IMDEA Materials Institute, Spain

10:20 - 10:40  In situ stable fracture of ceramic interfaces
Finn Giuliani, Imperial College London, UK

10:40 - 11:10  Coffee break

11:00 - 11:30  Miniaturized fracture experiments on pearlitic steel: Challenges and solutions
Gerhard Dehm, Max-Planck-Institut für Eisenforschung GmbH, Düsseldorf, Germany

11:30 - 11:50  Understanding the performance of nano-structured ferritic alloys through micro-mechanical testing
David Armstrong, University of Oxford, UK

11:50 - 12:10  Using simulations to investigate the apparent fracture toughness of microcantilevers
Steffen Brinckmann, Max-Planck-Institut für Eisenforschung, Düsseldorf, Germany

12:10 - 12:30  Fracture of silicon at low length scales
Jeffrey M. Wheeler, ETH Zurich, Switzerland

12:30 - 12:50  Elastic-plastic fracture toughness of electrodeposited Ni-W thick films using in-situ microcantilever bend tests
Denise Yin, Lehigh University, USA

13:00 - 14:30  Lunch

14:30 - 16:30  Networking / Time for ad hoc discussions
Monday, October 2, 2017 (continued)

16:30 - 19:00  **Session III: Coatings and small-scale fracture mechanics**

16:30 - 16:50  **Multiple cracking events in metal bi-layers on polymer substrates**  
Megan J. Cordill, Erich Schmid Institute of Materials Science, Leoben, Austria

16:50 - 17:10  **Mechanical properties and failure of Ag nanowire transparent electrodes studied by means of in situ tensile testing**  
Nadine Schrenker, University Erlangen-Nürnberg (FAU), Germany

17:10 - 17:30  **Fracture behavior of metallic thin films as evaluated by bulge-tests and in situ TEM deformation experiments**  
Mathias Göken, FAU Erlangen-Nürnberg, Germany

17:30 - 17:50  **Micro-mechanical testing of transition metal (oxy)nitride coatings**  
James S.K-L. Gibson, RWTH Aachen University, Germany

18:20 - 19:00  **Invited**  
**Filamentary growth of metals: Microstructure and properties of (nano-) whiskers**  
Gunther Richter, Max-Planck-Institute for Intelligent Systems, Stuttgart, Germany

19:00 - 20:00  **Poster Preview I**

20:00 - 21:30  **Dinner**

21:30 - 23:00  **Poster Session I with Social Hour**
**Tuesday, October 3, 2017**

07:30 - 09:00  Breakfast Buffet

09:00 - 13:00  **Session IV: In-situ Experiments II**

09:00 - 09:40  *Invited*

**Combined in situ mechanical testing and scale-bridging 3D analysis of nanoporous gold**
Erdmann Spiecker, University Erlangen-Nürnberg, Germany

09:40 - 10:00  **Plastic deformation and anisotropy of long-period-stacking-ordered structures in Mg-Zn-Y alloys**
Stefanie Sandlöbes, RWTH Aachen University, Germany

10:00 - 10:20  **Mechanical hysteresis of the MAX phase Ti$_2$AlN: A nano-mechanical testing study**
Christophe Tromas, Institut Pprime - Université de Poitiers, France

10:20 - 10:40  **Plasticity of an atomically layered crystal: A combined nanomechanical and ab initio study on Mo$_2$BC**
Sandra Korte-Kerzel, RWTH Aachen University, Germany

10:40 - 11:10  Coffee break

11:10 - 11:30  **The impact of grain boundary character on the size dependence of Bi-crystals**
Christoph Kirchlechner, Max-Planck-Institut für Eisenforschung, Düsseldorf, Germany

11:30 - 11:50  **Mechanical testing of nanotwinned alloys**
Andrea M. Hodge, University of Southern California, USA

11:50 - 12:10  **Mechanical testing of copper and copper alloy micropillars containing a single twin boundary**
Benoit Merle, University Erlangen-Nürnberg (FAU), Germany

13:00 - 19:00  Boxed lunch and optional excursion

19:00 - 20:15  Dinner

20:15 - 21:00  Poster Preview II

21:00 - 23:00  Poster Session II with Social Hour
Wednesday, October 4, 2017

07:30 - 09:00  Breakfast Buffet

09:00 - 13:00  Session V: New Instrumentation, Methods and Development

09:00 - 09:30  
*Highlight*

**Interface strength and toughness measurements in multi-layered systems**
Daniel Kiener, Erich Schmid Institute, Montanuniversität Leoben, Austria

09:30 - 09:50  

**Room temperature plasticity in sub-micrometer thermally grown oxide scales**
Magnus Hörnqvist Collieder, Chalmers University of Technology, Sweden

09:50 - 10:10  

**Femtosecond laser and FIB: A revolutionary approach in rapid micro-mechanical sample preparation**
Manuel J. Pfeifenberger, Montanuniversität Leoben, Austria

10:10 - 10:30  

**Microscale additive manufacturing of metal – mechanical properties**
Alain S. Reiser, ETH Zurich, Switzerland

10:30 - 11:00  Coffee Break

11:00 - 11:30  
*Highlight*

**Spatially resolved depth profiling of residual stress by micro-ring-core method**
Marco Sebastiani, Roma TRE University, Italy

11:30 - 11:50  

**Novel in situ nanomechanical tests: a new insight into the hydrogen embrittlement**
Afrooz Barnoush, Norwegian University of Science and Technology, Norway

11:50 - 12:10  

**Development and application of an in situ-SEM nanoindenter coupled with electrical measurements**
Fabien Volpi, Univ. Grenoble Alpes, CNRS, SiMaP Lab., Grenoble, France

12:10 - 12:30  

**Interfacial adhesion of compositional gradient ternary FCC alloy films**
Rachel L. Schoeppper, EMPA Swiss Federal Laboratories for Materials Science and Technology, Switzerland

12:30 - 12:50  

**Strain rate influence on the thermo-mechanical deformation behavior of Aluminum thin films**
Johannes Zechner, KAI GmbH, Villach, Austria

13:00 - 14:30  Lunch

14:30 - 16:30  Networking Time / Time for *ad hoc* discussions
**Wednesday, October 4, 2017 (continued)**

16:30 - 19:00 **Session VI: Small scale testing of advanced materials**

16:30 - 16:50

**Nanoscale compressive deformation mechanisms and yield properties of hydrated bone extracellular matrix**  
Jakob Schwiedrzik, EMPA - Swiss Federal Laboratories for Materials Science and Technology, Switzerland

16:50 - 17:10

**Cyclic indentation test to characterize viscoelastic behavior of polymers**  
Olga Smerdova, Institut Pprime - Université de Poitiers, France

17:10 - 17:30

**Probing crystalline phases in cubic boron nitride as a function of boron content by massive nanoindentation and microsample testing**  
Joan Josep Roa Rovira, Universidad Politecnica de Cataluña, Barcelona, Spain

17:30 - 17:50

**Anisotropic deformation of ZrB2 ceramic grains during in-situ micropillar compression up to 500°C**  
Tamás Csanádi, IMR-SAS, Slovakia

17:50 - 18:10

**Room temperature and high temperature micromechanical testing of SiC-SiC fiber composites for nuclear fuel cladding applications**  
Yevhen Zayachuk, Department of Materials, University of Oxford, UK

18:10 - 18:30

**Nanoindentation of Au nanoparticles – A combined experimental/computational multiscale study**  
Dan Mordehai, Technion - Israel institute of Technology, Israel

18:30 - 18:50

**A new type of superelastic and shape memory materials: ThCr2Si2-structured novel intermetallic compounds at small length scales**  
Seok-Woo Lee, University of Connecticut, USA

20:00 - 22:00  
Conference Dinner
Thursday, October 5, 2017

07:30 - 09:00  Breakfast Buffet

09:00 - 13:00  Session VII: New developments in indentation testing

09:00 - 09:30  Highlight
Wide dynamic range 2-D nanoindentation: Friction and partial slip at contacts
John B. Pethica, Trinity College Dublin, Ireland

09:30 - 09:50  Investigation of contact-induced near-surface materials transformations using nanomechanical testing.
Guillaume Kermouche, Ecole des Mines de Saint-Etienne, France

09:50 - 10:10  New methods for nanoindentation mapping to account for size dependence
Andy Bushby, Queen Mary University of London, UK

10:10 - 10:30  Scratching the surface of Lateral Size Effects (LSE): A critical comparison between indentation and scratch hardness size effects
Nigel Jennett, Coventry University, UK

10:30 - 11:00  Coffee Break

11:00 - 11:20  The formation and evolution of cracks during nanoindentation of fused quartz
Brittnee A. Mound, University of Tennessee, USA

11:20 - 11:40  Constitutive modeling of indentation cracking in fused silica
Sebastian Bruns, TU Darmstadt, Germany

11:40 - 12:00  Constant contact stiffness indentation relaxation test
Jean-Luc Loubet, CEMES-CNRS, Ecully, France

12:00 - 12:20  Spherical nanoindentation – advancements and prospects towards its application as a multifunctional testing technique
Alexander Leitner, Montanuniversität Leoben, Austria

12:20 - 12:40  Identification of macroscopic hardening law through spherical indentation: definition of an average representative strain and a confidence domain.
Charbel Moussa, MINES ParisTech, France

12:40 - 13:00  Size effect observed in spherical indentation test of single crystal copper
Stanislaw Kucharski, Institute of Fundamental Technological Research, Polish Academy of Science, Poland

13:00 - 14:30  Lunch

14:30 - 16:30  Session VIII: New instrumentation and Developments
Sponsored by Micro Materials Limited

14:30 - 14:50  Temperature dependence of indentation size effects, pile-up and strain rate sensitivity in polycrystalline tungsten from 25-950 C
Ben D. Beake, Micro Materials Ltd, UK
### Thursday, October 5, 2017 (continued)

<table>
<thead>
<tr>
<th>Time</th>
<th>Session Title</th>
<th>Presenter Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>14:50 - 15:10</td>
<td>Nanoindentation at elevated temperatures</td>
<td>Warren C. Oliver, Nanomechanics, Inc., Oak Ridge, USA</td>
</tr>
<tr>
<td>15:10 - 15:30</td>
<td>Microcompression high cycle fatigue tests up to 10 million cycles</td>
<td>Gaurav Mohanty, Alemnis, Thun, Switzerland</td>
</tr>
<tr>
<td>15:30 – 15:50</td>
<td>The effect of thermally induced stresses on indentation experiments</td>
<td>Ude D. Hangen, Bruker BNS, USA</td>
</tr>
<tr>
<td>16:30 - 19:00</td>
<td>Session IX: Deformation mechanisms</td>
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</tr>
<tr>
<td>16:30 - 16:50</td>
<td>Nanoindentation study of the temperature dependence of plastic instability in Al alloys.</td>
<td>Henry Ovri, Helmholtz Zentrum Geesthacht, Germany</td>
</tr>
<tr>
<td>16:50 - 17:10</td>
<td>Determination of mechanical properties of different sized silicon and silica nanowires tested in SEM</td>
<td>Nicole Wollschläger, Bundesanstalt für Materialforschung und –prüfung, Germany</td>
</tr>
<tr>
<td>17:10 - 17:30</td>
<td>Initiation of fatigue damage in ultra-fine grained thin films: Schmid, Taylor or Hall-Petch?</td>
<td>Oleksandr Glushko, Montanuniversität Leoben, Austria</td>
</tr>
<tr>
<td>19:00 - 21:00</td>
<td>Dinner followed by Social Hour</td>
<td></td>
</tr>
</tbody>
</table>

### Friday, October 6, 2017

<table>
<thead>
<tr>
<th>Time</th>
<th>Session Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>07:00 – 09:00</td>
<td>Breakfast and Departures</td>
</tr>
</tbody>
</table>
Poster Presentations

1. **Bulk metallic glass composites: microstructural influences on mechanical properties**
   Lisa Kraemer, Erich Schmid-Institute of Materials Sciences, Austrian Academy of Sciences; OEAW, Austria

2. **Locally resolved fracture mechanisms by using in-situ microscopic testing**
   Markus Alfreider, Erich Schmid Institute for Materials Science, Austrian Academy of Science, Austria

3. **High-resolution structural-mechanical characterization and simulation of novel barrier coatings**
   André Clausner, Fraunhofer IKTS, Germany

4. **Evolution of thickness dependent buckle geometries**
   Alice Lassnig, Erich Schmid Institute of Materials Science, Austrian Academy of Sciences; Department Materials Physics, Montanuniversität Leoben, Austria

5. **Changes in amorphous silica mechanical properties induced by femtosecond laser irradiation**
   Guillaume Kermouche, Ecole des Mines de Saint-Etienne, France

6. **Residual stress characterization in DLC coating by focused ion beam milling and finite element modeling**
   Sergio Sao Joao, Ecole des Mines de Saint-Etienne, LGF UMR5307 CNRS, France

7. **Combining high strength and moderate ductility in wear resistant coatings: a MO2BC study**
   Rafael Soler, Max-Planck-Institut für Eisenforschung, Germany

8. **Nanoindentation and optical properties of transparent metal oxide multilayers**
   Chelsea D. Appleget, University of Southern California, USA

9. **Mechanical behavior and size effects of polymer/amorphous NiB composites with 3D microarchitectures**
    Johann Michler, EMPA, Switzerland

10. **Effects of indenter geometry on micro-scale fracture toughness measurement by Pillar splitting**
    Marco Sebastiani, Roma TRE University, Italy

11. **High-speed nanoindentation for fast mechanical property mapping and surface patterning,**
    Riccardo Moscatelli, University of Rome “Roma TRE”, Italy

12. **Mechanical testing of twinned copper and copper alloy micropillars**
    Sebastian Krauß, FAU Erlangen-Nürnberg, Germany

13. **Small-scale insights into superplasticity using micromechanical testing methods**
    Patrick Feldner, Materials Science & Engineering, Institute I, Friedrich-Alexander-University Erlangen-Nuremberg (FAU), Germany
14. Ductile-brittle-transition of flash annealed Fe-based metallic glass ribbons
   Christian Minnert, TU Darmstadt, Germany

15. Indentation size effect and 3D dislocation structure evolution in (001) oriented SrTiO3: HR-EBSD and etch-pit analysis
   Farhan Javaid, Physical Metallurgy Division, Institute of Materials Science, Technische Universität Darmstadt, Germany

16. In-situ Bragg coherent X-ray diffraction during tensile testing of an individual Au nanowire
   Jungho Shin, University of Pennsylvania, USA

17. A model for size-effects in flat punch nanoindentation
   Christopher James Campbell, University of Leicester, United Kingdom

18. WITHDRAWN

19. Portevin-Le Chatelier effect in AlMg3% studied using elevated temperature nanoindentation
   Gaurav Mohanty, EMPA, Alemnis AG, Switzerland

20. An in-situ indentation system for high dynamic nanomechanical measurements
   Damian Frey, Alemnis, Switzerland

21. Superelasticity and micaceous plasticity of the novel intermetallic compound CaFe2As2 at small length scales
   John T. Sypek, University of Connecticut, USA

22. Ultra-high elastic strain energy storage in hybrid metal-oxide infiltrated polymer nanocomposites
   Keith Dusoe, University of Connecticut, USA

23. Micro-fracture experiments on nanocomposite hard coatings
   Matthias Bartosik, TU Wien, Austria

24. Deformation behavior of gold/copper multilayer systems
   Hauke L. Honig, TU Ilmenau, Germany

25. Determination of stress-strain relation using instrumented ball indentation at micron scale
   Alexey Useinov, TISNCM, Russia

26. New Tools to solve known problems at critical nanoindentation measurements
   Wolfgang Alfred Stein, SURFACE Nanometrology, Germany

27. Nanoindentation tests using flat punch indenter - Contact formation and tilt correction
   Dennis Bedorf, SURFACE, Germany

28. Microcompression experiments on glasses - strain rate sensitive cracking behavior
   Christoffer Zehnder, RWTH Aachen University, Germany
29. Room temperature deformation mechanisms of the C14 Laves Phase in the Mg-Al-Ca system  
   Christoffer Zehnder, RWTH Aachen University, Germany

30. Using impact-nanoindentation to test glasses at high strain rates and room temperature  
   Christoffer Zehnder, RWTH Aachen University, Germany

31. Observing the size effect in copper-chromium-zirconium using spherical indentation  
   Alexandra Joanna Cackett, Queen Mary University of London, UK Atomic Energy Authority,  
   United Kingdom

32. WITHDRAWN

33. Determination of Mechanisms of Abrasion in WC/Co hard metals by In situ micro-tribology  
   experiments  
   Mark Gee, National Physical Laboratory, United Kingdom

34. WITHDRAWN

35. Analyzing the onset of plasticity in Fe-3wt.%Si  
   Nousha Kheradmand, NTNU, Norway

36. Hydrogen enhanced cracking studies by in-situ electrochemical micro cantilever bending test  
   Tarlan Hajilou, NTNU, Norway

37. Real-time in situ micro-mechanical testing of hard metals using FIB-SEM  
   Helen Jones, National Physical Laboratory, United Kingdom

38. WITHDRAWN

39. Hydrogen-microstructure interactions in bcc FeCr alloys by in-situ nanoindentation  
   Maria Jazmin Duarte Correa, Max-Planck-Institut für Eisenforschung GmbH, Germany

40. Micropillar compression of hexagonal and cubic NbCo$_2$ Laves phases  
   Wei Luo, Max-Planck-Institut für Eisenforschung GmbH, Germany

41. WITHDRAWN

42. Indentation behavior of single-crystalline tungsten  
   Jin Wang, Karlsruhe Institute of Technology (KIT), Institute of Applied Materials （IAM）,  
   Germany

43. Nanoindentation of ferritic-martensitic steels – a comparative study of static and dynamic  
   measurements  
   Ana Ruiz Moreno, Joint Research Centre. European Commission, Netherlands

44. Monitoring the breath through mechanical movements of the chest using continuous wave  
   bioradar system  
   Giovanni Cerasuolo, Italian Aerospace Research Centre, Italy
45. Heat flux gauge calibration using the blackbody
   Giovanni Cerauolo, Italian Aerospace Research Centre, Italy

46. Micromechanical testing of Mo-B-C layers prepared by magnetron sputtering
   Jiří Buršík, Institute of Physics of Materials, Czech Academy of Sciences, Czech Republic

47. Indentation modulus and Young's modulus of Cu-Cr-Zr alloy at macro-scale level
   Alessandro Schiavi, INRIM - National Institute of Metrological Research, Italy

48. Effect of pre-existing dislocations on the strength of gold at very small scales
   Paula O. Guglielmi, Helmholtz-Zentrum Geesthacht, Experimental Materials Mechanics, Institute of Materials Research, Germany

49. WITHDRAWN

50. From Reactive multilayer nanofoils to self-healing metallic systems
    Stefano Danzi, ETH Zurich, Laboratory for NanoMetallurgy, Switzerland

51. Portevin-Le Chatelier effect studied at small scale
    Yuan Xiao, Laboratory for Nanometallurgy, ETH Zurich, Switzerland

52. Plasticity and size effects in germanium: From cryogenic to elevated temperatures
    Ming Chen, Laboratory for Nanometallurgy (LNM), Department of Materials, ETH Zurich, Switzerland

53. An almost unifying theory for grain boundary-based plasticity
    Marc Legros, CEMES-CNRS, France

54. Thermo oxidative aging of polymers and polymer-matrix composites studied with cyclic indentation
    Olga Smerdova, ENSMA, France

55. Fracture toughness of thermal barrier coatings determined by micro cantilever bending tests
    Sven Giese, University Erlangen-Nuremberg, Germany

56. WITHDRAWN

57. Experimental design for uniaxial tensile measurements at the microscale
    Daniele Casari, EMPA, Swiss Federal Laboratories for Materials Science and Technology, Switzerland

58. Nanomechanical test specimen preparation techniques by microfabrication and two-photon lithography to avoid FIB induced Ga implantation damage
    Laszlo Pethö, EMPA, Switzerland

59. Indentation relaxation test: Opportunities and limitations
    Paul Baral, Ecole Centrale de Lyon, France
<table>
<thead>
<tr>
<th>Session</th>
<th>Title</th>
<th>Speaker/Institution</th>
</tr>
</thead>
<tbody>
<tr>
<td>60</td>
<td>A new push-pull sample design for microscale mode 1 fracture toughness measurements under uniaxial tension</td>
<td>Johann Jakob Schwiedrzik, EMPA Swiss Federal Laboratories for Materials Science and Technology, Switzerland</td>
</tr>
<tr>
<td>61</td>
<td>In situ micromechanical testing inside the scanning electron microscope at subambient temperatures</td>
<td>Johann Jakob Schwiedrzik, EMPA Swiss Federal Laboratories for Materials Science and Technology, Switzerland</td>
</tr>
<tr>
<td>62</td>
<td>Small-Scale Mechanical Testing of Nuclear Structural Materials</td>
<td>Vineet Bhakhri, Canadian Nuclear Laboratories, Chalk River, Canada</td>
</tr>
<tr>
<td>63</td>
<td>Size effects in electrodeposited Ni – coatings</td>
<td>Michael Griepentrog, Bundesanstalt für Materialforschung und -prüfung BAM, Germany</td>
</tr>
<tr>
<td>64</td>
<td>High temperature nanoindentation up to 800°C for characterizing high temperature properties of materials</td>
<td>Nicholas Randall, Anton Paar TriTec, Switzerland</td>
</tr>
<tr>
<td>65</td>
<td>Nanomechanical testing of Ti/Ni multilayer thin films</td>
<td>Vilma Bursikova, Masaryk University, Czech Republic</td>
</tr>
<tr>
<td>66</td>
<td>Methods of actual indenter shape determination</td>
<td>Jaroslav Čech, Czech Technical University in Prague, Czech Republic</td>
</tr>
<tr>
<td>67</td>
<td>Influence of the Interface and the microstructural length scale on the grid indentation</td>
<td>Petr Hausild, Czech Technical University in Prague, Czech Republic</td>
</tr>
<tr>
<td>68</td>
<td>Limitation of Hall-Petch relationship for interpreting scratch on polycrystalline copper using spherical indenter</td>
<td>Xiaodong Hou, Coventry University, United Kingdom</td>
</tr>
<tr>
<td>69</td>
<td>WITHDRAWN</td>
<td></td>
</tr>
<tr>
<td>70</td>
<td>Annealing effect on the Fracture Toughness of CrN/TiN Superlattice Systems</td>
<td>Rainer Hahn, Christian Doppler Laboratory for Application Oriented Coating Development at the Institute of Materials Science and Technology, TU Wien, Austria</td>
</tr>
<tr>
<td>71</td>
<td>(Nano-)Mechanical properties and deformation mechanisms of the topologically closed packed Fe-Mo55 μ-Phase at room temperature</td>
<td>Sebastian Schröders, RWTH Aachen University, Germany</td>
</tr>
<tr>
<td>72</td>
<td>XFEM modelling of ball indentation cracking in a-C:H Coatings</td>
<td>Sebastian Bruns, TU Darmstadt, Germany</td>
</tr>
<tr>
<td>73</td>
<td>Investigating the local fatigue properties of materials by dynamic micropillar Compression</td>
<td>Benoît Merle, University Erlangen-Nürnberg (FAU), Germany</td>
</tr>
</tbody>
</table>
74. Influence of modulus-to-hardness ratio and harmonic parameters on continuous stiffness measurement during nanoindentation
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