Symposium J : Materials Characterization and in situ/3D/4D Analysis

November 20 (Mon.), 2023

Session Title : Materials Characterization and in situ/3D/4D Analysis 1
Time : 10:50 - 12:25, Nov. 20
Room # : 201B, 2F
Session Chair

10:50 – 11:20 **Keynote** **I-J0482**

Effect of Heterogeneous Deformation Microstructure on the Primary Recrystallization Behavior of FCC Alloys

Shi-Hoon Choi, Sunchon National University, Korea

11:20 – 11:40 **Invited** **I-J0567**

Structure, interfacial segregation and transformations of precipitates in lightweight alloys

Laure Bourgeois, Monash University, Australia

11:40 – 11:55 **O-J0711**

High-throughput phase diagram examinations on multicomponent systems using sintered diffusion multiples

Teruyuki Ikeda, Ibaraki University, Japan

11:55 – 12:10 **O-J1001**

Evolution of the Microstructural Parameters and Twining Behavior in 316L Stainless Steel during Deformation Process by in-situ EBSD

Bin Huang, Northwestern Polytechnical Unversity, China

12:10 – 12:25 **O-J0914**

Micromechanical properties of Cu micro-lattice under extreme deformation conditions

Kang Sung-Gyu, Max-Planck-Institut Für Eisenforschung, Germany

Session Title : Materials Characterization and in situ/3D/4D Analysis 2
Time : 14:00 - 15:20, Nov. 20
Room # : 201B, 2F
Session Chair

14:00 – 14:30 **Keynote** **K-J1**

Kazuto ARAKAWA, Shimane University, Japan

14:30 – 15:00 **Keynote** **K-J0171**

Role of dislocation movement on the phase transformation of metastable precipitate to stable phase in the steels

YOON-UK HEO, Pohang University of Science and Technology, Korea

15:00 – 15:20 **Invited** **I-J0799**

Direct observation of quadrupolar strain fields forming a shear band in metallic glasses using 4D-STEM

Sangjun Kang, Karlsruhe Institute of Technology & Technical University Darmstadt, Germany

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Session Title : Materials Characterization and in situ/3D/4D Analysis 3

Time : 16:00 -18:10, Nov. 20

Room # : 201B, 2F

Session Chair

16:00 – 16:30 **Keynote** **K-J0873**

Strain localisation in engineering alloys – quantifying discrete shear to improve understanding of plasticity and crack initiation

Michael Preuss, Monash University, Australia

16:30 – 16:50 **Invited** **I-J0225**

Recent Advances of Synchrotron 4D X-ray Tomography with Millisecond-Order Temporal Resolution

Wataru YASHIRO, Tohoku University, Japan

16:50 – 17:10 **Invited** **I-J0728**

Tracking hydrogen-induced microstructural evolution in materials using in situ scanning electron microscope techniques

Jin Woo Kim, Korea Institute of Science and Technology, Korea

17:10 – 17:25 **O-J0432**

Characterization of Ni nano-particles by laboratory high energy Ultra-Small Angle X-ray Scattering (USAXS)

Masato Ohnuma, Hokkaido University, Japan

17:25 – 17:40 **O-J0412**

In-Situ Study of Liquid-Liquid Phase Separation Behavior in Cu-Fe Alloys by Synchrotron X-ray Imaging

Daehoon Jeong, Pohang University Of Science And Technology, Korea

17:40 – 17:55 **O-J0183**

In-Situ SEM Observation Combined with DIC Strain Analysis for Understanding Deformation and Cracking in Metal Coatings

Dasom Kim, Nagoya University, Japan

17:55 – 18:10 **O-J0517**

Study of crack propagation, dislocation movement and deformation twin evolution in Al-Sc alloy during in-situ TEM tension

Zhongwei Chen, Northwestern Polytechnical University, China

November 21 (Tue.), 2023

Session Title : Materials Characterization and in situ/3D/4D Analysis 4
Time : 10:50 - 12:30, Nov. 21
Room # : 201B, 2F
Session Chair

10:50 – 11:20 **Keynote** **K-J1168**
The origin of jerky dislocation motion in high-entropy alloys
Sang Ho Oh, Korea Institute of Energy Technology, Korea

11:20 – 11:40 **Invited** **I-J0438**
Atomic scale in situ observations of the mechanical response of lattice defects
Eita TOCHIGI, The University of Tokyo, Japan

11:40 – 12:00 **Invited** **O-J0671**
Multiple plasticity-enhancing mechanisms of the FeMnCoCr based high entropy alloys
Jinkyung Kim, Hanyang University ERICA, Korea

12:00 – 12:15 **O-J0630**
Substantially enhanced homogeneous plastic flow in hierarchically nanodomained amorphous alloys
Ge Wu, Xi'an Jiaotong University, China

12:15 – 12:30 **O-J0093**
Grain orientation mapping of 1 mm-thick α-Fe by scanning 3DXRD
Jaemyung Kim, RIKEN, Japan

Session Title : Materials Characterization and in situ/3D/4D Analysis 5
Time : 14:00 - 15:25, Nov. 21
Room # : 201B, 2F
Session Chair

14:00 – 14:30 **Keynote** **K-J0755**
Materials Characterisation and Modelling, Critical for the Materials Development Lifecycle
Natasha Wright, CSIRO, Australia

14:30 – 14:50 **Invited** **I-J0464**
A machine-learning assisted optimization approach and microstructure characterization method for laser powder bed fusion
Xiaopeng Li, University of New South Wales, Australia

14:50 – 15:10 **Invited** **I-J0770**
Geological Sequestration of CO2 in Sandstone Formations: Deep Dive into Residual Trapping Mechanisms
Mohammad Saadatfar, The University of Sydney, Australia

15:10 – 15:25 O-J0676

Simulation of the blister formation in the electro-galvanized steel

Sang-Hoon Shin, Pohang University Of Science And Technology, Korea

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Session Title : Materials Characterization and in situ/3D/4D Analysis 6

Time : 16:00 - 17:40, Nov. 21

Room # : 201B, 2F

Session Chair

16:00 – 16:20 Invited I-J1075

Atom Probe Study on Interface Segregation and Interphase Precipitation in Microalloyed Steels

Hung-Wei Yen, National Taiwan University, Taiwan

16:20 – 16:35 O-J0107

Spatial incorporation of thermal analysis with high-temperature microscope: A case study of peritectic solidification in steel

Suk-Chun Moon, University of Wollongong, Australia

16:35 – 16:50 O-J0611

Investigation of the Microstructure and Mechanical Properties of Steels Subjected to Laser Ablation Treatment

Jiawei Tu, The University of Sydney, Australia

16:50 – 17:05 O-J0675

Analysis of temperature characteristics of axle box bearings in high-speed operation of railway vehicles

Jeongguk Kim, Korea Railroad Research Institute, Korea

17:05 – 17:20 O-J0520

Massive interstitial solid solution medium-entropy alloys achieve ultrahigh strength and large deformability

Chang Liu, Xi'an Jiaotong University, China

17:20 – 17:40 Invited I-J1152

HAADF-STEM-EDS analysis and post APT runs for observing superfast solute transport in L12 precipitation-hardened Ni-based superalloys

Jae Bok Seol, Gyeongsang National University, Korea

November 22 (Wed.), 2023

Session Title : Materials Characterization and in situ/3D/4D Analysis 7
Time : 10:50 - 12:45, Nov. 22
Room # : 201B, 2F
Session Chair

10:50 – 11:10 **Invited** **I-J0538**

Developing a New Set of Calibration Alloys for High-Temperature Thermal Analysis

Kil-Won Moon, National Institute of Standards and Technology, USA

11:10 – 11:25 **O-J0880**

Effects of crystallographic orientation on mechanical properties and deformation behaviours of small-volume copper

HEQING LI, The University of Sydney, Australia

11:25 – 11:40 **O-J0679**

In situ observation on the bonding of Al-Sn alloys to carbon steel

Ahmad Zamanian Khorasgani, Pohang University of Science and Technology, Korea

11:40 – 11:55 **O-J0767**

Investigation of mechanical behavior and serration deformation mechanism for structural materials at ultra-cryogenic temperature below 20K

You Sub Kim, Chungnam National University, Korea

11:55 – 12:10 **O-J0265**

Low temperature synthesis of high Sn concentration GeSn by electron beam irradiation

Manabu ISHIMARU, Kyushu Institute of Technology, Japan

12:10 – 12:25 **O-J0475**

Correlation of microstructure and the luminescence properties in GaN/InGaN multi-quantum wells grown on semi-polar m-plane sapphire substrate by using Transmission Electron Microscopy

Young-Woon Kim, Seoul National University, Korea

12:25 – 12:45 **Invited** **I-J0769**

Crystallographic mechanism of crack initiation and short crack growth during cyclic deformation in zirconium

Conghui Zhang, Xi'an University of Architecture And Technology, China