

# INTERNATIONAL JOURNAL FOR MULTISCALE COMPUTATIONAL ENGINEERING

## CONTENTS, VOLUME 15, 2017

Page Range of Issues – Issue 1: 1–98; Issue 2: 99–197; Issue 3: 199–283; Issue 4: 285–378;  
Issue 5: 379–458; Issue 6: 459–565

---

### ISSUE 1

Particle-Filter Based Upscaling for Turbulent Reacting Flow Simulations <i>S. Srivastava &amp; T. Echeekki</i>	1
A Fast Three-Level Upscaling for Short Fiber-Reinforced Composites <i>M. Krówczynski &amp; W. Cecot</i>	19
Multiscale Homogenization Schemes for the Construction of Second-Order Grade Anisotropic Continuum Media of Architectured Materials <i>Y. Rahali, F. Dos Reis, &amp; J.F. Ganghoffer</i>	35
An Equivalent Continuum Approach for Modeling Two-Phase Flow in Fractured-Vuggy Media <i>Y. Li, J. Yao, Y. Li, C. Yin, B. Pan, J. Lee, &amp; M. Dong</i>	79

### ISSUE 2

Concurrent Atomistic-Continuum Model for Developing Self-Consistent Elastic Constitutive Modeling of Crystalline Solids with Cracks <i>J. Zhang, S. Chakraborty, &amp; S. Ghosh</i>	99
Multi-Yield Surface Modeling of Viscoplastic Materials <i>H. Yan &amp; C. Oskay</i>	121
Iterative Global-Local Approach to Consider the Effects of Local Elasto-Plastic Deformations in the Analysis of Thin-Walled Members <i>R.E. Erkmen &amp; A. Saleh</i>	143
Bayesian Multiscale Finite Element Methods. Modeling Missing Subgrid Information Probabilistically <i>Y. Efendiev, W.T. Leung, S.W. Cheung, N. Guha, V.H. Hoang, &amp; B. Mallick</i>	175

### ISSUE 3

Molecular Dynamics Study on Interfacial Thermal Resistance between Organic Nanoparticles and Alkali Molten Salt Mixtures <i>B. Jo &amp; D. Banerjee</i>	199
Modeling of Thin Composite Laminates with General Anisotropy under Harmonic Vibrations by the Asymptotic Homogenization Method <i>Yu.I. Dimitrienko &amp; I.D. Dimitrienko</i>	219
A Coupled Computational Approach for the Simulation of Soil Excavation and Transport in Earth-Pressure Balance Shield Machines <i>T.S. Dang, N. Wessels, N.-S. Nguyen, K. Hackl, &amp; G. Meschke</i>	239
A Stochastic Inverse Problem for Multiscale Models <i>N. Panda, T. Butler, D. Estep, L. Graham, &amp; C. Dawson</i>	265

## ISSUE 4

### SPECIAL ISSUE: MULTISCALE MODELLING OF MATERIALS AND STRUCTURES, PT. I

GUEST EDITORS: TADEUSZ BURCZYŃSKI, XAVIER OLIVER, MACIEJ PIETRZYK,  
& ALFREDO HUESPE

Preface: Multiscale Modelling of Materials and Structures, Pt. I	v
<i>T. Burczyński, X. Oliver, M. Pietrzyk, &amp; A. Huespe</i>	
The Voids Formation in Ni–Cu Alloys	285
<i>B. Wierzba, S. Wędrychowicz, W.J. Nowak, P. Wierzba, &amp; Z. Grzesik</i>	
(n)- and (n + 1)-Layered Composite Sphere Models for Thermo-Chemo-Mechanical Effective Properties	295
<i>R. Mahnken, C. Dammann, &amp; P. Lenz</i>	
Micro-Macro Relationships from Discrete Element Simulations of Sintering	323
<i>J. Rojek, S. Nosewicz, &amp; M. Chmielewski</i>	
Estimation of Micromechanical NiAl Sintering Model Parameters from the Molecular Simulations	343
<i>M. Mażdziarz, J. Rojek, &amp; S. Nosewicz</i>	
On Some Aspects of the Meshless FDM Application for the Heterogeneous Materials	359
<i>I. Jaworska</i>	

## ISSUE 5

### SPECIAL ISSUE: MULTISCALE MODELLING OF MATERIALS AND STRUCTURES, PT. II

GUEST EDITORS: TADEUSZ BURCZYŃSKI, XAVIER OLIVER, MACIEJ PIETRZYK,  
& ALFREDO HUESPE

Preface: Multiscale Modelling of Materials and Structures, Pt. II	v
<i>T. Burczyński, X. Oliver, M. Pietrzyk, &amp; A. Huespe</i>	
Method for Determining Structures of New Carbon-Based 2D Materials with Predefined Mechanical Properties	379
<i>A. Mrozek, W. Kuś, &amp; T. Burczyński</i>	
Analysis of Thermal Processes Occurring in the Microdomain Subjected to the Ultrashort Laser Pulse using the Axisymmetric Two-Temperature Model	395
<i>E. Majchrzak, J. Dziatkiewicz, &amp; L. Turchan</i>	
Analysis of Predictive Capabilities of Multiscale Phase Transformation Models based on the Numerical Solution of Heat Transfer and Diffusion Equations	413
<i>M. Pernach, K. Bzowski, L. Rauch, &amp; M. Pietrzyk</i>	
Virtual Metallic Foams. Application for Dynamic Crushing Analysis	431
<i>R.B. Pęcherski, M. Nowak, &amp; Z. Nowak</i>	
Validation of the Dual-Phase Steel Failure Model at the Microscale	443
<i>K. Perzynski, Y. Ososkov, D.S. Wilkinson, M. Jain, J. Wang, &amp; L. Madej</i>	

## ISSUE 6

Size-Dependent Vibration Analysis of Multilayer Composite Microbeam based on New Modified Couple Stress Theory	459
<i>W. Zhen, Y. Zhichun, &amp; C. Wanji</i>	

<b>A Benchmarking of Competing Bio-Objective Functions for Multiresponse Optimization of UASB System in Pretreatment of Poultry Manure Slurry <i>K. Yetilmezsoy</i></b>	<b>477</b>
<b>Reconciled Top-Down and Bottom-Up Hierarchical Multiscale Calibration of bcc Fe Crystal Plasticity <i>A.E. Tallman, L.P. Swiler, Y. Wang, &amp; D.L. McDowell</i></b>	<b>505</b>
<b>A Surrogate Modeling Approach for Additive-Manufactured Materials <i>H. Xin, W. Sun, &amp; J. Fish</i></b>	<b>525</b>
<b>Entropy Analysis of Unsteady Magnetohydrodynamic Nanofluid over Stretching Sheet with Electric Field <i>Y.S. Daniel, Z.A. Aziz, Z. Ismail, &amp; F. Salah</i></b>	<b>545</b>
<b>Index, Volume 15, 2017</b>	<b>566</b>

# INTERNATIONAL JOURNAL FOR MULTISCALE COMPUTATIONAL ENGINEERING

## AUTHOR INDEX, VOLUME 15, 2017

**Page Range of Issues – Issue 1: 1–98; Issue 2: 99–197; Issue 3: 199–283; Issue 4: 285–378;  
Issue 5: 379–458; Issue 6: 459–565**

---

- |                         |                        |                       |
|-------------------------|------------------------|-----------------------|
| Aziz, Z.A., 545         | Hackl, K., 239         | Pęcherski, R.B., 431  |
| Banerjee, D., 199       | Hoang, V.H., 175       | Pernach, M., 413      |
| Burczyński, T., 379     | Ismail, Z., 545        | Perzynski, K., 443    |
| Butler, T., 265         | Jain, M., 443          | Pietrzyk, M., 413     |
| Bzowski, K., 413        | Jaworska, I., 359      | Rahali, Y., 35        |
| Cecot, W., 19           | Jo, B., 199            | Rauch, L., 413        |
| Chakraborty, S., 99     | Krówezyński, M., 19    | Rojek, J., 323, 343   |
| Cheung, S.W., 175       | Kuś, W., 379           | Salah, F., 545        |
| Chmielewski, M., 323    | Lee, J., 79            | Saleh, A., 143        |
| Congbin, Y., 79         | Lenz, P., 295          | Srivastava, S., 1     |
| Dammann, C., 295        | Leung, W.T., 175       | Sun, W., 525          |
| Dang, T.S., 239         | Li, Y., 79             | Swiler, L.P., 505     |
| Daniel, Y.S., 545       | Madej, L., 443         | Tallman, A.E., 505    |
| Dawson, C., 265         | Mahnken, R., 295       | Turchan, L., 395      |
| Dimitrienko, I.D., 219  | Majchrzak, E., 395     | Wang, J., 443         |
| Dimitrienko, Yu.I., 219 | Mallick, B., 175       | Wang, Y., 505         |
| Dong, M., 79            | Maździarz, M., 343     | Wanji, C., 459        |
| Dos Reis, F., 35        | McDowell, D.L., 505    | Wędrychowicz, S., 285 |
| Dziatkiewicz, J., 395   | Meschke, G., 239       | Wessels, N., 239      |
| Echekki, T., 1          | Mrozek, Z., 379        | Wierzba, B., 285      |
| Efendiev, Y., 175       | Nguyen, N.-S., 239     | Wierzba, P., 285      |
| Emre Erkmen, R., 143    | Nosewicz, S., 323, 343 | Wilkinson, D.S., 443  |
| Estep, D., 265          | Nowak, M., 431         | Xin, H., 525          |
| Fish, J., 525           | Nowak, W.J., 285       | Yan, H., 121          |
| Ganghoffer, J.F., 35    | Nowak, Z., 431         | Yao, J., 79           |
| Ghosh, S., 99           | Oskay, C., 121         | Yetilmezsoy, K., 477  |
| Graham, L., 265         | Ososkov, Y., 443       | Zhang, J., 99         |
| Grzesik, Z., 285        | Pan, B., 79            | Zhen, W., 459         |
| Guha, N., 175           | Panda, N., 265         | Zhichun, Y., 459      |

# INTERNATIONAL JOURNAL FOR MULTISCALE COMPUTATIONAL ENGINEERING

## SUBJECT INDEX, VOLUME 15, 2017

**Page Range of Issues – Issue 1: 1–98; Issue 2: 99–197; Issue 3: 199–283; Issue 4: 285–378;  
Issue 5: 379–458; Issue 6: 459–565**

---

- 2D atomic structures, 379  
3D network, 35  
additive manufacturing, 525  
AHSS steels, 413  
asymptotic homogenization method, 219  
Bayesian, 175  
brittle fractures, 443  
carbon diffusion, 413  
composite desirability function, 477  
composite sphere model, 295  
compressed liquid layer, 199  
compression test, 431  
computational homogenization of discrete media, 525  
concurrent atomistic-continuum coupling, 99  
constrained optimization, 505  
convergence acceleration, 143  
convex cell, 431  
coupled Darcy-Stokes model, 79  
crack tip field, 99  
curing, 295  
cutting wheel, 239  
cyclic loading, 121  
diffusion, 285  
diffusivity, 343  
digital material representation, 443  
discrete element method, 239, 323, 525  
ductile fractures, 443  
effective properties, 295  
entropy generation, 545  
equivalent continuum, 79  
evolutionary algorithm, 379  
FE simulations, 35  
finite difference method, 395  
finite element analysis, 99  
finite element method, 219, 239  
flow simulation, 79  
fractured-vuggy media, 79  
free vibrations, 219  
functionalization, 199  
Gibbs, 175  
global-local analysis, 143  
graphenelike materials, 379  
heterogeneous material, 359  
higher order FEM, 19  
higher-order zig-zag model, 459  
homogenization, 295  
Hu-Washizu variational principle, 459  
hybrid algorithm, 379  
in situ tensile test, 443  
interfacial thermal resistance, 199  
internal length scales, 35  
Joule heating, 545  
kinetic modeling, 477  
Kirkendall plane, 285  
large-eddy simulation, 1  
local effects, 143  
local problems, 219  
mass conservation, 285  
MCMC, 175  
mechanical properties, 379  
meshless methods, 359  
metallic foams, 431  
MHD nanofluid, 545  
micro-macro relationships, 323  
microscale heat transfer, 395  
microstructured beams, 35  
model selection, 265  
molecular dynamics, 99, 343  
molecular statics, 343  
molten salt, 199  
MsFEM, 19  
multicriteria optimization, 477  
multipoint method, 359  
multiscale calibration, 505  
multiscale finite element method, 175  
multiscale methods, 35  
multiscale modeling, 1, 323, 413  
multiscale models, 265  
multiscale, 175  
multi-yield surface plasticity, 121  
nanofluids, 199  
nanoparticles, 343  
natural frequency, 459  
new modified couple stress, 459  
NiAl, 343  
non-Newtonian flow, 239  
numerical homogenization, 19, 359  
numerical simulation, 431  
open-cell copper, 431  
orthotropic GTN model, 525  
parameter determination, 265  
parameter identification, 239  
particle filter, 1  
pearlitic rail steels, 413  
permeability tensor, 79  
phase transformations, 413  
plate theory, 219  
poultry manure slurry, 477  
radiative heat transfer, 545  
re-entrant cell, 431  
representative volume element, 19  
RTM, 295  
RVE, 295  
second gradient, 35

- self-consistent elastic model, 99  
shrinkage, 295  
simulation, 323  
sintering, 323, 343  
stochastic inverse problems, 265  
surrogate modeling, 505  
thermal energy storage, 199
- thermo-mechanical-chemical coupling, 295  
thin composite laminates, 219  
thin-walled members, 143  
tunnel boring machine, 239  
turbulent reacting flows, 1  
two-temperature model, 395  
UASB reactor, 477  
ultra-short laser pulse, 395
- uncertainty quantification, 265  
vibration of microbeam, 459  
virtual cellular materials, 431  
viscoelastic-viscoplastic behavior, 121  
viscous dissipation, 545  
voids, 285

