# MSEE2018 Table of Content

## Chapter 1. Material Science and Advanced Materials

Research on the Geo-metrical and Radio-Metrical Topography  Correction of the RADARSAT-2 Image ................................. 1  
**Jiwen Zhu, Jiang Liu, Jinling Yang, Xianglai Meng and He Zhang**

Synthesis and Characterization of Ester Bond-Containing Polyethyleneimine Functionalized Carbon Nanotubes .................... 7  
**Qiao Zhang, Shuwen Huang, Fangzheng Yu, Huili Fu, Liang Li and Guoping Yan**

Effect of C/S Ratio on Microstructure of Calcium Silicate Hydrates Synthesised by Solution Reaction Method ..................... 13  
**Yazhou Wang, Qinglin Zhao, Shangqun Zhou and Song Wang**

Mechanical Properties Analysis of Patch Repaired Composite Structures with Debonding Flaw ............................................ 21  
**Xia Guo, Hai Chi, Junzhi He, Weili Liu, Guanghui Hu and Xia Gao**

Effects of AlCl₃ on the Crystal Morphology of Calcium Sulfate Whisker Prepared from FGD Gypsum ................................. 28  
**Xiao Wang, Biao Jin, Zhuoyue Xu, Xiaoting Zhang, Xueping Liu, Liushuan Yang**

Study on Preparation and Photocurrent Response Properties of In/In₂O₃/TiO₂ Nanotubes Arrays Compound Heterojunction Semiconductor ............................................. 32  
**Yu Tan, Yunfei Xu, Kexin Liang and Shenghan Zhang**

Exploring the Function Fatigue Behavior of Ferromagnetic Shape Memory Alloy ......................................................... 41  
**Jia Ju, Yan Kang, Liguo Shuai and Chen Yan**

Poly (Vinylidene Fluoride)/Mg doped CaCu₃Ti₄O₁₂ Composites with Improved Dielectric Properties ................................. 46  
**Hanghang Wang, Huiwu Cai, Wenying Zhou and Shengnan Liu**

Overview of Slope Monitoring Technology ............................................. 52  
**Panpan Yang, Nianqin Wang, Zhongyan Jiang, Yan Yang and Heping Yan**
Characterization of Oxide Scales on Super-Alloy HR120 at 1000 °C in Air and Steam Environments .................................................. 57
  Xiumin Ren and Zhiyuan Liang

Change in Plasticity of Copper under Weak Electrical Potentials ................. 62
  Konovalov Sergey, Shunqi Mei, Osintsev Kirill, Filip’ev Roman and Komissarova Irina

Preparation and Properties of an Anti-Friction and Anti-Corrosive Radar Absorbing Material with Periodic Intermediate Coating ................. 66
  Xingji Tang, Xianbin Li and Hongguo Sun

Dynamic Systems: Passivity and Positivity Properties ............................ 70
  Manuel De La Sen

Design and Implementation of Intelligent Monitoring System for Brake Shearing Machine ................................................................. 76
  Yong Wang, Jiamin Zhu, Sheng Chen, Jun Yu and Dabing Chen

Optimization of Chainsaw Setting Angle in Pruning Robot ............................ 84
  Haruhisa Kawasaki, Mouri Tetuya, Toshitake Yanagawa and Haruo Nagayama

Speed and SOC Planning-based Control Strategy for Hybrid Electric Vehicle ................................................................. 90
  Qingyun He, Benhan Yang, Daming Cai and Zongxiao Yang

Basic Experiment of LIDAR Sensor Measurement Directional Instability for Moving and Vibrating Object ........................................... 100
  Shinya Hama and Hideki Toda

Development of Autonomous 4 Rotor Helicopter 50 M-range Movement Control Method by Using Single Search Light and the Evaluation ................................................................. 105
  Naoki Kasamatsu and Hideki Toda

Development of Rough Terrain Mobile Robot Control Strategy Capable of Position and Direction Estimation by a Single Marker ...................... 111
  Yuki Kurahashi and Hideki Toda

Movable Ankle Joint Stretching Device by Stabilization of Ankle Position Using Tension Rod Structure .................................................. 117
  Shin Sugihara, Hideki Toda and Takahiro Yamaguchi
Chapter 2. Material Engineering and Application

On-line Fault Diagnosis Method for Power Transformer Based on Missing Data Repair .................................................. 161
Xiansi Lou, Weihan Liao, Jianbo Yin, Qiukuan Zhou, Chen Kang, Shiying Ma and Dunwen Song

Numerical Study on Effect of the Slippage on the Cross-Section Size and Profile for Inverse Extrusion Forming of Plastic Micro-Tubes ................................................................. 170
Zhong Ren and Xingyuan Huang

The Properties and Latest Application of Geopolymers ............................................. 175
Yanguang Wu, Bowen Lu, Zhuangcheng Yi, Feipeng Du, Yunfei Zhang
Study on Fractal Model for Predicting Permeability and Effective Thermal Conductivity to Fibres of Cut-Tobacco .................................................................. 179
Zhicai Jiang, Xue Ding, Hua Huang, Wei Zhou, Ting Fang and Qi Sun

Nonlinear Finite Element Simulation on Seismic Behaviour of Steel Frame-Central Brace with Ring Damper ......................................................... 186
Xiaotong Peng, Chen Lin, Yongming Cao and Wenxu Duan

Nonlinear Finite Element Analysis on Seismic Performance of Steel Corrugated Shear Wall ................................................................. 193
Xiaotong Peng, Chen Lin, Tingting Zhang and Xu Zhang

Three-Point Bending Fracture Properties of Multilayer Metal Hot Forging Die Specimen ................................................................. 200
Huajun Wang, Qingyang Liu, Nian Han, Liang Yao and Chundong Zhu

Heaviside-Based Morphological Filters for Topology Optimization ................................................................. 207
Longfei Qie, Shikai Jing and Ruichao Lian

Research on High Temperature Friction and Wear Characteristics of H₁₃-Cr₂C₃-CaF₂ Self-lubricating Materials ................................................. 212
Runyin Rao, Huajun Wang, Menglu Li, Zhenhua Yao, Qingyang Liu and Songshan Yan

Numerical Simulation Method Study of Rock Fracture Based on Strain Energy Density Theory ................................................................. 218
Tengfei Ma, Shuchen Li and Qian Sun

Superfine Ce Oxide-Induced Precipitation Behavior of Copper in Steel ................................................................................................. 231
Zhongyuan Li, Changrong Li, Peng Wang, Shixin Zhang, Longhai Cheng and Wenhui Du

Study on Performance of Polyvinyl Chloride Treated by Plasma ............. 238
Runjin Gui and Zhiwen Wang

Failure Analysis of Fractured Cylinder Bolt .................................................. 244
Xiaodan Zhang, Nan Li, Zhiqiang Luo, Jikang Li and Long Liu
Effect of Dealumination of Citric Acid-Modified Hβ Molecular Sieve on Hydroisomerization Performance of n-Hexadecane .......................... 248
Xuefeng Bai, Xiaomeng Wei, Yang Liu and Wei Wu

The Impact Compressive Properties of 7075-T651 Aluminium Alloy over a Wide Range of Strain Rates and Temperatures .......................... 255
Xin Guo and Li Song

Heat Transfer Characteristics of Twin Circular Jet Impingement Cooling on the Strip Surface after Rolling ................................. 262
Jiahui Shi, Liping Bian, Ruquan Liang and Song Xiao

Study on Recrystallization Organization of Workpiece about Processing Hole Using Friction Heat .................................................. 268
Xiaocun Xu, Xin Li and Yu Zhao

Effect of Inorganic Components on Properties of Ceramizable Phenolic Resin Matrix Composites ................................................. 276
Dongpei He, Minxian Shi, Yuqing Yang and Zhixiong Huang

The Effect of Bauschinger Related Parameters on Material Property of Dh780 and Springback Behavior of Longitudinal Beam ............................................. 281
Wenyu Ma, Jianwei Yang, Xuebin Zheng, Baochuan Wang, Chunguang Li and Yongqiang Zhang

Experimental Study of Hydrothermal Spallation Drilling .......................... 289
Mingbo Wang and Ning Wang

Preparation and Properties of Anti-Insulation Integrated Phenolic Resin Composites .......................................................... 296
Duan Ge, Minxian Shi, Yalin Yao, Shican Jiang, Dongpei He and Zhixiong Huang

Synthesis of Cu2O/biochar Composites and Their Antibacterial Activity against Escherichia Coli ......................................................... 302
Bujun Yang, Haiqian Wang, Qing Yang, Qikai Zhang, Lanmei Zou, Min Wu, Hongbin Zhang, Qusheng Song and Shaoming Yu

Functional Requirements Analysis and Practical Design of Plug-and-Play Energy Interconnect Terminals .................................. 308
Aiqiang Pan
Study on Static Recrystallization Behavior of 38MnVTi Non-quenched and Tempered Steel ........................................ 313
Luwei Dai, Yuanfang Chen, Hui Zeng, Ding Xie and Tao Zhang

Simulation Study on Noise Reduction Performance of Thickness of Sound Absorber Films in Industrial Gas Turbine Muffler ...................... 322
Jiangang Yi and Siwei Ju

Structural Parameters Analysis of Sound Absorption Films in Industrial Gas Turbine Muffler ................................................. 327
Jiangang Yi and Siwei Ju

The Investigation on Adhesive Contact Problem of Gradient Piezoelectric Coating under Insulating Punch ................................. 332
Weixing Huang and Tiejun Liu

The Quality Detection Technology and Characterization Marking of Knife Edge ................................................................. 337
Zhonghua Su, Taizhong Huang, Lichang Fan, Haipeng Mi, Xiong Deng and Xiaodong Deng

Preparation of Catalyst Supported by CuO-CoO-MnO/SiO₂ Nanocomposite Aerogel and its Catalytic Performance in the Synthesis of Diphenyl Carbonate ........................................ 342
Yueqing Zhao, Xizhe Zhao, Mingxi Zhang and Qianyi Jia

Development of a Solid-Phase Microextraction-Surface-Enhanced Raman Scattering Approach to Detect Ferbam ............................... 349
Shan Wang, Jinhui Zhao, Guoqiang Wu, Weijun Leng and Chunrong Wang

Development and Performance Evaluation of a New Compound Humidity Control Building Material ............................................. 354
Yuehua Shen

Research on Optimization Design of Local Damping Vibration Reduction .................................................................................... 360
Simi Tang

Effect of Hydrogen Nutrition Denitrifying Bacteria on Nanoscale Zero-Valent Iron Settlement .................................................... 367
Qing Xia, Ruixue Liu, Chenzi Xu and An Yi
Field Electron Emission from the Tip of a Graphite Fiber  ....................... 373
Jin Zhang, Ergang Chen, Rongli Wang, Yiming Xiao, Fanquan Kong and Hai Wang

Application Research in Accident Classification Based on Fuzzy Evaluation System  ......................................................... 379
Qiang Ren and Genyin Cheng

Study on Aerodynamic Characteristics of Flapping Wings Motion Mode  ................................................................. 385
Cui Wang, Hongde Wang, Jiangbo Sun and Qiang Liu

Chapter 3. Environment Protection and Sustainable Development

Research on Test Method for Low-Temperature Performance Consistency of Power Battery Pack  ........................................... 391
Hongwei Wang, Jun Liu, Qiang Ma, Yanling Fu, Ziqiang Tao, Haiqing Xiao and Hua Bai

Glutaraldehyde/Polyvinyl Alcohol Crosslinked Nanosphere Modified Corn Stalk Reinforced Polypropylene Composite  ................... 396
Shanshan Liu, Heyi Ge, Yu Zou and Juan Chen

Effect of the Cross-Linking Modification on Corn Stalk Fiber Reinforced Polypropylene Composites  ................................. 402
Shanshan Liu, Ke Li, Yu Zou and Juan Chen

The Combustion Characteristics of Coal Blends under Low Oxygen Atmosphere Using the Thermogravimetric Analyzer ................. 408
Liangliang Liu, Zhiqing Wang and Yukun Qin

Investigation on Weeds in Vegetable Fields in the Northern Suburbs of Meizhou City, South China  ........................................ 413
Qihe Yang, Caixia Zhang, Xiaojuan Yin and Hesheng Yang

Comprehensive Evaluation of Geological Environment Carrying Capacity for Lintong District, Xi'an  ................................. 423
Renwei Li and Nianqin Wang

Full Waveform Inversion Based on Wavefield Correlation  ........................ 430
Xue Chen and Helong Yang
Experience of Protecting World Heritage in Norway: a Case Study of Røros Town .................................................. 435
Chang Liu

Overview of High-Value Reuse and Grinding at Sub-Zero Temperature of Scrap Rubber Tires .................................................. 440
Qiucheng Wang, Zijun Huang and Zhengqing Liu

Study on the Determination of Free Formaldehyde in Carbon-Coated Air Purifying Material by Water Extraction Method .......................................................... 446
Ruiyan Zhang, Haijiao Zhang, Dan Ma and Xuehong Han

Study on Preventive Measures for Serious Water Inrush Accident in Underground Tunnel Engineering—the case of Water Inrush in a Tunnel Project .................................................. 453
Yuxue Bao

Study on Optimization of New Type of Seepage Well Structure in Sponge City .................................................. 458
Zewei Wu, Chaoxian Deng, Jianhui Si, Kan Zhao, Yue Ma and Hanghang Liang

Trivalent Chromium Conversion Coating Formed on Hot Dip Zn-55Al-1.6Si Coated Steel .................................................. 465
Yan Li, Jie Pan and Jiantao Qi

Application of Modified Organic-Inorganic Hybrid Zirconium Phosphate Material ZAMPS-PVPA-salen-Mn (III) in Chemical fixation of CO₂ .................................................. 471
Liang Zhou, Biwei Gong, Zhiyong Yang, Deju Wei and Wei Lu

A Hybrid Energy Storage System Controlled by Two Degree-of-freedom PID for Wind Power Generations .................................................. 478
Daming Cai, Zongxiao Yang, Yanfeng Wu and Gensheng Li

Chapter 4. Environmental Science and Engineering

Research on the Water Area extraction in Suzhou based on Remote Sensing .................................................. 484
Zhilong Xi, Jiang Liu and Dandan Liu
Analysis of Key Environmental Impact Factors Based on Fuzzy Clustering and Grey T’ s Correlation Degree Method  ........................................ 490
Gaofei Zhao, Yujie Huo, Zhaofeng Zhang and Zhaoyuan Peng

Numerical Simulation and Experimental Study of Three-Dimensional Density-Stratified Flow  ................................................................. 498
Ming Yang, Ming Wang, Fangxiu Zhang and Ruixun Lai

Finite Element Analysis of the Brake Drum Based on ANSYS APDL .......................................................... 505
Bin Zheng and Jingdong Zhang

Research Progress on treatment technology of Produced water by Adsorption Method  ................................................................. 512
Xiangbin Liu

Multi-scale Full Waveform Inversion Based on Curvelet Transform .......................................................... 517
Helong Yang, Xue Chen, Jiangwei Zhang and Daheng Guo

Improvement of Gas Drainage Efficiency of Low-Permeability Coal Seams Using Ultra-High Pressure Hydraulic Cutting Technique  .......................................................... 522
Yongjiang Zhang

Preparation of GO-Based Iron-Containing and Adsorption of Cr in Water .......................................................... 528
Qiaobing Wang, Tao Feng and Shuo Xiong

Design of Video Image Low-Pass Filtering Process Based on FPGA .......................................................... 536
Xiaojing Zhang and Hua Wang

Effect of Polypropylene Fiber on Properties of Aeolian-Sand Mortar .......................................................... 541
Junhua Guo, Zhenghong Yang and Chunyong Gao

Finite Element Analysis of Overlying Soil Failure Based on Fault Dip Angle .......................................................... 547
Tingting Guo, Xiwei Xu and Guihua Yu

Anomaly Detection for Environmental Data using Machine Learning Regression .......................................................... 555
Fuqing Yuan and Jinmei Lu
Mechanical Properties of Riverbank Soil in the Jingjiang Reach and the Characteristics of Flow in Pocket Collapse Area  
Jun Wang, Zhaoxi Liu and Hongyan Yue  

The Distribution of Heavy Metals in the Sediment of Low Tidal Flat, Eastern Chongming Island, China  
Jinmei Lu and Fuqing Yuan  

Study on the Purification Effect of Clean Fresh Air on PM2.5 in the Bedroom  
Qian Yuan and Guojian Li  

PIV Experimental Study on Flow Field near Lateral jet under the Condition of Vegetation  
Sufen Teng, Minquan Feng and Kailin Chen  

Discussion on the Methods to Make the Military Highway Unimpeded in Plateau  
Yunhong Zhang, Wei Qiao and Hai Wang  

The Impact of Electrified Railway on Oil Depot by Military Railway  
Wei Qiao, Yunhong Zhang and Yang Wu  

Simultaneous Reduction and Covalent Combining of Tetraethylenepentamine on Graphene Oxide  
Qunxiang Ren, Xiaoyan Shen, Jun Zhang and Jiayun Liu  

Design of Air Floating EGR Water Treatment Device  
Fangyong Wang and Zhanguang Wang  

Design of Mixed Scrubbing and Desulfurization System for a Marine Engine  
Fangyong Wang and Hao Guo