

目 次

综 述

天文学、地球科学

道路结冰的温度预报方法研究进展

..... 胡继超, 林子静, 成 添(1)

建筑科学

海砂制备混凝土合规资源化关键问题

..... 邵雅婷, 汪志强, 蔡志军, 何 旭, 周继凯(7)

真空预压法处理吹填超软地基 10 a 进展及展望

..... 李明东, 潘耀森,
郎鈔棚, 戴仁辉, 董金奎, 牛 刚, 柴新军(15)

论 文

数 学

基于特征正交分解与离散经验插值的浅水波模式降阶解法

..... 陶苏林, 李雨鸿, 周 寅, 刘 垚(23)

力 学

输水隧洞建造过程中泵送混凝土管道的冲蚀机理

..... 梁 爽, 南 轩, 陆金才, 丁红春, 黄剑峰(34)

可渗透弹性悬臂梁式薄板横向绕流变形分析

..... 高欣悦, 郝亚娟(38)

天文学、地球科学

重力卫星时变重力场去相关滤波算法的参数选择

..... 崔立鲁, 唐兴友, 邹正波, 宋 哲, 许文超(43)

基于最小体积封闭椭球算法的多段水力压裂改造体积估算

..... 王旭林, 桂志先, 王 鹏, 易娟子(48)

二维黏弹介质五点八阶超紧致有限差分声波方程数值模拟

..... 周诚尧, 汪 勇, 桂志先, 于晓东(54)

基于灰色关联度-主成分法的高速公路雾灾评估模型——以沿海高速江苏段为例

..... 周林义, 钱 玮, 崔海蓉, 王宏斌(64)

钻孔地质雷达天线收发信号数值模拟

..... 彭凌星, 何现启, 朱自强(69)

寺家庄矿煤层顶板岩性有色反演预测

..... 冯凯宇, 曹志勇, 张新军(75)

地下采煤引起的黄土裂隙化物理模型试验研究

..... 魏岩朔, 张常亮, 成玉祥, 周潇朗, 王振宇(82)

转化型二次失稳边坡变形特征及失稳成因分析——以余凯高速 RK24 滑坡为例

..... 王 洁, 程谦恭, 李 星, 刘乃康, 张鹏元(89)

第 20 卷第 1 期 (总第 506 期)

基于确定性系数模型与逻辑回归模型耦合的地质灾害易发性评价——以贵州省开阳县为例

..... 覃乙根, 杨根兰, 江兴元, 鲁鲲鹏, 李子安(96)

医药卫生

黄芪丹参配伍提取物经 VEGF、Ang1/Tie2 通路对心肌梗死大鼠血管新生的病理影响

..... 张璿方, 李梦华, 刘 暖, 杨 雷, 毛秉豫(104)

基于集合经验模式分解和公共空间模式的脑电信号特征提取

..... 张学军, 霍 延, 黄丽亚, 成谢锋(109)

肥胖低通气综合征患者血清瘦素水平的变化及意义

..... 马青青, 朱述阳, 朱洁晨(118)

一般工业技术

基于卡方检验的计算流体力学网格无关性分析

..... 谢 宇, 任金波, 黄煌辉, 张 翔(123)

基于氮化铝薄膜的压电水听器的研制

..... 赵 龙, 刘 铮, 王 强, 薛晨阳(128)

矿冶工程

600 MPa 级汽车大梁钢疲劳极限确定和疲劳断裂原因分析

..... 卢军辉, 刘家琪, 仇圣桃, 干 勇(135)

石油、天然气工业

黏土矿物微观孔隙对甲烷吸附行为的分子模拟

..... 黄 涛, 刘德华, 孙 敬(141)

基于离散裂缝网络模型的陆相页岩超临界 CO₂ 压裂滤失特征

..... 罗 攀,
乔红军, 李 哲, 黄 昊, 孙 晓, 贺 沛(146)

页岩储层黏土矿物对裂缝导流能力伤害的影响

..... 杨 柳, 石富坤, 赵逸清, 葛洪魁, 周 彤(153)

聚合物驱油井无因次流入动态方程及其应用

..... 王 全, 康晓东, 陈冠中, 朱志杰, 刘玉洋(159)

普通稠油降黏剂驱物理模拟和数值模拟

..... 刘祖鹏(164)

注入时机对低矿化度表面活性剂驱油的影响

..... 蒲多芬, 杨 浩(170)

长宁区块页岩气水平井组地质工程一体化

..... 黄浩勇, 范 宇, 曾 波, 赵圣贤, 常 程(175)

渐缩型气动喷砂喷嘴冲蚀模拟分析

..... 王 博, 徐 鑫, 王卫强(183)

机械、仪表工业

基于高斯伪谱法的双摆桥式起重机消摆策略分析

..... 刘岩松, 王宗彦, 石瑞敏, 李 松(189)

能源与动力工程

- 凹坑结构对麻面管流动与传热特性的影响分析
 闫顺林, 张莎, 何仑(196)
- 碱土金属和沙柳对煤热解过程中协同作用的影响
 高学艺, 冯晓飞, 王克冰(202)
- 风力机错列布置的尾流效应
 张志阳, 魏敏, 胡蓉, 张立新, 李辉(207)

电工技术

- 基于差分进化极限学习机的电力系统暂态稳定评估方法
 李向伟, 刘思言, 高昆仑(213)
- 考虑 CO₂ 排放成本的风储联合调度优化
 庄红山, 李永光, 张彦军, 马晓磊, 赵志刚(218)
- 基于改进灰色关联分析的 BA-BP 短期负荷预测
 刘晓悦, 魏宇册(223)
- 考虑电磁力影响的四分裂导线舞动
 蔡萌琦, 周林抒, 杨晓辉, 伍川, 刘小会(228)

电子技术、通信技术

- 认知无线电中基于压缩感知的非重构频谱检测算法
 安爽, 邵建华(234)

自动化技术、计算机技术

- 基于 ORB-SLAM2 的三维占据网格地图的实时构建
 王飞, 王耀力(239)
- 基于残差网络的高温合金微观组织图像分割方法
 张利欣, 车世界, 徐正光, 付超, 袁立, 边胜琴(246)
- 基于改进的卷积神经网络图像识别方法
 张珂, 侯捷(252)
- 改善汽车变速器壳体端面波纹度的优化路径分析
 徐卫权, 张露青, 李永祥, 毛玮, 杨建国(258)
- 跨境电商系统用户数据库智能访问方法优化
 刘彩霞(265)

化学工业

- 油页岩气体热载体干馏炉内流动特性
 华泽嘉, 王擎, 蒋佳奇, 王智超(271)

建筑科学

- 填充墙布置方式对弹塑性钢筋混凝土框架抗震结构性能及抗震设计方法的影响
 赵桂峰, 马玉宏, 崔秀丽, 吴小平(279)
- 基于三剪强度准则的非饱和土库仑主动土压力
 崔舜, 雷胜友(291)

盾构始发端垂直冻结温度场数值分析与现场实测

- 李晓娜, 杨双锁, 鲍飞翔, 赵智辉(297)
- 顺层牵引式路堑滑坡综合整治方案
 李帅, 王玉兰, 朱琦, 张伟(303)
- 基于主成分分析-相关向量机的高速公路路基沉降量预测
 张研, 邝贺伟(312)

交通运输

- 输气管道第三方破坏数值分析及安全评价方法
 黄雪松, 张佳, 周兆明, 谭金松(320)
- 成贵高铁高坡隧道软岩大变形机理分析及病害整治
 张羽军, 丁浩江(327)
- 沥青铺装高温摊铺时钢箱梁温度分布 赵国云(335)
- 沉管基槽开挖对桥墩侧向位移影响的模型试验
 谷任国, 梁建勋(340)
- 沥青混合料铺筑温度场的有限差分仿真模型
 王黎明, 李峯(348)
- 车身后部结构气动性能自动优化及其工程应用
 陆润明, 廖抒华, 覃紫莹, 韩广龙(354)

航空、航天

- 基于健康指数相似的航空发动机剩余寿命预测
 曹惠玲, 梁佳旺, 崔科璐(361)
- 基于合成射流的高空飞艇分离流控制
 曾友兵, 胡涛, 徐小芮, 马宝峰(367)

环境科学、安全科学

- 基于粗糙集-模糊 C 均值聚类的 Elman 神经网络农村需水量预测
 李伟, 李艳, 吴佳懋(373)
- 石家庄市采暖期空气质量特征及其与气象条件的关系
 王云霞, 张艳杰, 孟令尧, 张焱, 曹跟华, 赵江伟(381)
- 南通地区酸雨变化特征及影响因素分析 缪明榕, 周红根, 王辉, 鲍磊磊, 王剑林, 汤建国(388)
- 基于物元分析法的贵阳近郊菜地土壤重金属污染评估
 李丁, 王济, 宣斌, 蔡雄飞, 赵士杰(397)
- 辽宁兴城松北铅锌矿化区土壤-植物系统中重金属分布和迁移特征
 邢春博, 郝立波, 赵新运, 赵玉岩, 汤肖丹, 臧利斌, 苑艺怀(406)
- 基于模糊神经网络的路桥工程建设项目应急能力评价
 涂晶, 李伟, 陈欣悦, 庞奇志(412)
- 基于权重分析的航空物探遥感空勤人员疲劳影响因素
 鞠星, 牛海波, 张贺然, 晁倩倩(417)

Contents

Surveys

Astronomy and Geosciences

Research Progress on Temperature Prediction Method for Road Icing HU Ji-chao, LIN Zi-jing, CHENG Tian(1)

Architectural Science

Key Issues of Resource Utilization of Sea Sand for Concrete Production in Compliance with Regulations TAI Ya-ting, WANG Zhi-qiang, CAI Zhi-jun, HE Xu, ZHOU Ji-kai(7)

Review and Outlook in Improvement of Hydraulic Fill *via* Vacuum Preloading in the Past Ten Years LI Ming-dong, PAN Yao-sen, LANG Chao-peng, DAI Ren-hui, DONG Jin-kui, NIU Gang, CHAI Xin-jun(15)

Papers

Mathematics

Reduced-order Modelling for Shallow-water Equations Model *via* Proper Orthogonal Decomposition and Discrete Empirical Interpolation
... TAO Su-lin, LI Yu-hong, ZHOU Yin, LIU Yao(23)

Mechanics

The Internal Erosion Mechanism of Concrete Pipeline-Pumping during Construction of Water Tunnel
..... LIANG Shuang, Nan Xuan, LU Jin-cai, DING Hong-chun, HUANG Jian-feng(34)

Analysis on Small Deformation of Permeable Elastic Cantilever Thin Beam-plate in Cross-flow
..... GAO Xin-yue, HAO Ya-juan(38)

Astronomy and Geosciences

Parameter Selection in De-correlation Filter Algorithm for Gravity Satellite Time-Variable Gravity Field
..... CUI Li-lu, TANG Xing-you, ZOU Zheng-bo, SONG Zhe, XU Wen-chao(43)

Estimation of the Stimulated Reservoir Volume of Multi-stage Hydraulic Fracturing in Minimum Volume Enveloping Ellipsoid Algorithm WANG Xu-lin, GUI Zhi-xian, WANG Peng, YI Juan-zi(48)

Numerical Simulation of 2D Viscoelastic Acoustic Wave Equation Used Five Point Eight Order Combined Compact Difference Scheme ZHOU Cheng-yao, WANG Yong, GUI Zhi-xian, YU Xiao-dong(54)

Assessment Model of Fog Disaster at Expressway Based on GRAPCA: Taking Coastal Expressway in Jiangsu as an Example
..... ZHOU Lin-yi, QIAN Wei, CUI Hai-rong, WANG Hong-bin(64)

Numerical Simulation on Signal Transmission and Receiving of Borehole Radar Antenna
..... PENG Ling-xing, HE Xian-qi, ZHU Zi-qiang(69)

Lithology Prediction of Coal Roof Rock in Sijiazhuang Coal Mine Using Colored Inversion Algorithm
... FENG Kai-yu, CAO Zhi-yong, ZHANG Xin-jun(75)

Experimental Study on Physical Model of Loess Fissure Caused by Underground Coal Mining
..... WEI Yan-shuo, ZHANG Chang-liang, CHENG Yu-xiang, ZHOU Xiao-lang, WANG Zhen-yu(82)

Deformation and Instability Analysis of the Transformed Seconda-

Volume 20 Number 1 (Sum 506)

ry Landslide—A Case of the RK24 Landslide in Yuqing-Kaili Expressway WANG Jie, CHENG Qian-gong, LI Xing, LIU Nai-kang, ZHANG Peng-yuan(89)

Geohazard Susceptibility Assessment Based on Integrated Certainty Factor Model and Logistic Regression Model for Kaiyang, China QIN Yi-gen, YANG Gen-lan, JIANG Xing-yuan, LU Kun-peng, LI Zi-an(96)

Medicine

Pathological Effect of *Astragalus-salvia-miltiorrhiza* Extract on Angiogenesis of MI Rats *via* VEGF and Ang1/Tie2 Pathway
..... ZHANG Li-fang, LI Meng-hua, LIU Nuan, YANG Lei, MAO Bing-yu(104)

A Novel Electroencephalography Feature Extraction Based on Ensemble Empirical Mode Decomposition and Common Spatial Pattern ZHANG Xue-jun, HUO Yan, HUANG Li-ya, CHENG Xie-feng(109)

Variation and Its Implication of Serum Leptin Level in the Patient of Obesity Hypoventilation Syndrome
... MA Qing-qing, ZHU Shu-yang, ZHU Jie-chen(118)

General Industrial Technology

Grid Independence Analysis of Computational Fluid Dynamics Based on Chi-square Test XIE Yu, REN Jin-bo, HUANG Huang-hui, ZHANG Xiang(123)

Development of Piezoelectric Hydrophone Based on AlN Film
..... ZHAO Long, LIU Zheng, WANG Qiang, XUE Chen-yang(128)

Mining and Metallurgical Engineering

Determination of Fatigue Limit and Analysis of Fatigue Fracture of 600 MPa Automobile Frame Steel LU Jun-hui, LIU Jia-qi, QIU Sheng-tao, GAN Yong(135)

Petroleum and Natural Gas Industry

Simulation on Adsorption of Methane in Micro-pore of Clay Minerals HUANG Tao, LIU De-hua, SUN Jing(141)

Leak off Characteristics of Supercritical CO₂ in Lacustrine Shale Based on Discrete Fracture Network Model
..... LUO Pan, QIAO Hong-jun, LI Zhe, HUANG Hao, SUN Xiao, HE Pei(146)

Effect of Clay Minerals in Shale Reservoirs on Fracture Conductivity YANG Liu, SHI Fu-kun, ZHAO Yi-qing, GE Hong-kui, ZHOU Tong(153)

Application of Dimensionless Inflow Performance Relationship Equation of Oil Well for Polymer Flooding
..... WANG Quan, KANG Xiao-dong, CHEN Guan-zhong, WEI Zhi-jie, LIU Yu-yang(159)

Physical Experiments and Numerical Simulations of Viscosity Reducer Flooding for Ordinary Heavy Oil
..... LIU Zu-peng(164)

The Impact of Injection Occasion on Low Salinity Surfactant Flooding PU Wan-fen, YANG Hao(170)

Geology-engineering Integration of Platform Well in Changning Block HUANG Hao-yong, FAN Yu, ZENG Bo, ZHAO Sheng-xian, CHANG Chen(175)

Erosion Simulation Analysis of Tapered Pneumatic Blasting Nozzle WANG Bo, XU Xin, WANG Wei-qiang(183)

Mechanical and Instrumental Industry

Analysis on Anti-swing of Double Pendulum Bridge Crane Based

on the Gauss Pseudo-spectral Method LIU Yan-song,
WANG Zong-yan, SHI Rui-min, LI Song(189)

Energy and Power Engineering

Influence of Pit Structure on Flow and Heat Transfer of Pitted Tube YAN Shun-lin, ZHANG Sha, HE Lun(196)
Synergistic Effect of Alkali Metals and Biomass on Coal Pyrolysis
... GAO Xue-yi, FENG Xiao-fei, WANG Ke-bing(202)
Influence of Wake-up Effect Based on Staggered Arrangement of Wind Turbine ZHANG Zhi-yang,
WEI Min, HU Rong, ZHANG Li-xin, LI Hui(207)

Electrical Technology

Assessment of Power System Transient Stability Based on Differential Evolution Extreme Learning Machine
..... LI Xiang-wei, LIU Si-yan, GAO Kun-lun(213)
Optimal Dispatch of Wind Power Storage Considering CO₂ Emission Costs ZHUNAG Hong-shan, LI Yong-guang,
ZHANG Yan-jun, MA Xiao-lei, ZHAO Zhi-gang(218)
Short-term Load Forecasting of BA-BP Neural Network Based on Improved Grey Relational Analysis
..... LIU Xiao-yue, WEI Yu-ce(223)
Galloping Behaviors of Quad Bundle Conductor Lines with Considering Effects of Electromagnetic Forces
..... CAI Meng-qi, ZHOU Lin-shu,
YANG Xiao-hui, WU Chuan, LIU Xiao-hui(228)

Electronic and Communicational Technology

Algorithm of Compressed-Sensing-Based Non-reconstructed Spectrum Detection in Cognitive Radio
..... AN Shuang, SHAO Jian-hua(234)

Automation and Computational Technology

Real-time Construction of 3D Occupied Grid Map Based on ORB-SLAM2 WANG Fei, WANG Yao-li(239)
Microstructure Image Segmentation of Superalloy Based on Resunet ZHANG Li-xin, CHE Shi-jie, XU Zheng-guang,
FU Chao, YUAN Li, BIAN Sheng-qin(246)
A New Image Recognition Method in Improved Convolution Neural Network ZHANG Ke, HOU Jie(252)
Optimal Path Analysis for Improving the Waviness on the End Surface of Automobile Transmission Housing
..... XU Wei-quan, ZHANG Lu-qing,
LI Yong-xiang, MAO Wei, YANG Jian-guo(258)
Optimization of Smart Access to User Database for International Trading System LIU Cai-xia(265)

Chemical Industry

On Flow Characteristics of Oil Shale Gas Thermal Carrier Dry Distillation Furnace HUA Ze-jia,
WANG Qing, JIANG Jia-qi, WANG Zhi-chao(271)

Architectural Science

Influence of the Arrangement of Infilled Walls on Design and Aseismic Performance of Isolated System in Elastic-plastic Reinforced Concrete Frame ZHAO Gui-feng,
MA Yu-hong, CUI Xiu-li, WU Xiao-ping(279)
Coulomb's Active Earth Pressure of Unsaturated Soil Based on Triple Shear Failure Criterion
..... CUI Shun, LEI Sheng-you(291)
Numerical Analysis and Field Measurement of Vertical Freezing Temperature Field at the Beginning of Shield Tunneling
..... LI Xiao-na,
YANG Shuang-suo, BAO Fei-xiang, ZHAO Zhi-hui(297)

A Comprehensive Treatment Scheme for a Case of Bedding Traction Cutting Landslide LI Shuai,
WANG Yu-lan, ZHU Qi, ZHANG Wei(303)
Settlement Prediction of Highway Subgrade with Reterance Vector Machine Based on Principal Component Analysis
..... ZHANG Yan, KUANG He-wei(312)

Traffics and Transportations

Numerical Analysis and Safety Evaluation Method of Third Party Damage in Gas Pipeline HUANG Xue-song,
ZHANG Jia, ZHOU Zhao-ming, TAN Jin-song(320)
Large-deformation Mechanism and Gountermeasures of Soft Rock in Gaopo Tunnel on Chengdu-Guiyang High-speed Railway
..... ZHANG Yu-jun, DING Hao-jiang(327)
Temperature Distribution in Steel Box Girder during High Temperature Paving of Asphalt Pavement ... ZHAO Guo-yun(335)
A Model Test on Lateral Displacement of Bridge Piers during Excavation of Sinking Pipe Foundation
..... GU Ren-guo, LIANG Jian-xun(340)
Finite Difference Simulation Model of Temperature Field of Asphalt Mixture Pavement WANG Li-ming, LI Yin(348)
Automatic Optimization of Aerodynamic Performance of Rear Structure of Vehicle Body and Its Engineering Application
..... LU Run-ming,
LIAO Shu-hua, QIN Zi-ying, HAN Guang-long(354)

Aeronautics and Astronautics

Residual Life Prediction of Aeroengine Based on Health Index Similarity
..... CAO Hui-ling, LIANG Jia-wang, CUI Ke-lu(361)
Separation Flow Control of Airship with Synthetic Jet
..... ZENG You-bing,
HU Tao, XU Xiao-rui, MA Bao-feng(367)

Environmental and Safe Science

Elman Neural Network Forecast of Rural Water Demand Based on Rough Set-fuzzy C-means Clustering
..... LI Wei, LI Yan, WU Jia-mao(373)
Relationship between Air Quality and Meteorological Condition during Heating Period of Shijiazhuang City WANG Yun-xia,
ZHANG Yan-jie, MENG Ling-yao,
ZHANG Yan, CAO Gen-hua, ZHAO Jiang-wei(381)
Variation Characteristics and the Impact Factors of Acid Raining in Nantong Jiangsu, China MIAO Ming-rong,
ZHOU Hong-gen, WANG Hui,
BAO Lei-lei, WANG Jian-lin, TANG Jian-guo(388)
Assessment of Heavy Metals Pollution in Vegetable Farming Soils in Guiyang City Suburbs Based on Matter Element Analysis
..... LI Ding, WANG Ji,
XUAN Bin, CAI Xiong-fei, ZHAO Shi-jie(397)
Distribution and Migration Characteristics of Heavy Metals in Soil-plant System in Songbei Pb-Zn Mining Area, Xingcheng, Liaoning Province XING Chun-bo,
HAO Li-bo, ZHAO Xin-yun, ZHAO Yu-yan,
TANG Xiao-dan, ZANG Li-bin, YUAN Yi-huai(406)
Emergency Capability Evaluation of Road and Bridge Construction Projects Based on Fuzzy Neural Network TU Jing,
LI Wei, CHEN Xin-yue, PANG Qi-zhi(412)
Influencing Factors Analysis of Aero Physical Survey and Remote Center Flight Crew Based on the Weight Analysis
..... JU Xing, NIU Hai-bo,
ZHANG He-ran, CHAO Qian-qian(417)