

科学出版社
出版
中国地理学会环境遥感分会
中国科学院遥感与数字地球研究所
主办

JOURNAL OF REMOTE SENSING

遥感学报

2015年

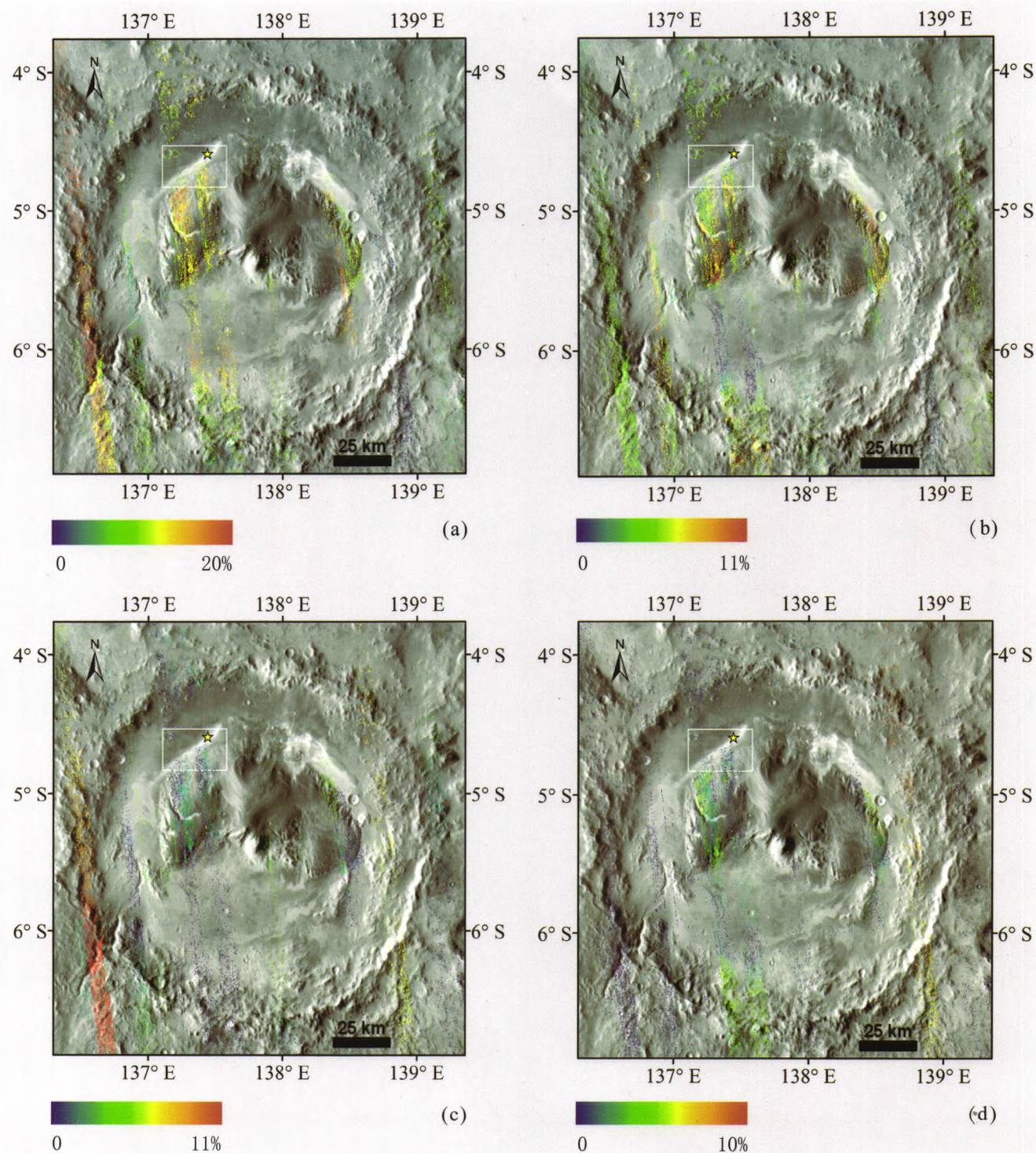
Vol.19

第19卷

No.6

第6期

ISSN 1007-4619 CN11-3841 / TP CODEN YXAUAB



百种中国杰出学术期刊

遥感学报

Yaogan Xuebao

第 19 卷 第 6 期 2015 年 11 月

目 次

综述

- 跨时空观下的遥感应用新视野 路京选, 宋文龙, 曲伟, 付俊娥 (873)
- GNSS-R 遥感观测模式及陆面应用 万玮, 李黄, 洪阳, 陈秀万, 彭学峰 (882)
- 3 维场景植被冠层多波段模拟研究进展
..... 张阳, 柳钦火, 覃文汉, 刘强, 李静, 杜永明, 谢东辉, 黄华国, 杨乐, 倪文俭 (894)

基础理论

- 地面站点叶面积指数观测的空间代表性评价——以 CERN 站网观测为例
..... 徐保东, 李静, 柳钦火, 曾也鲁, 尹高飞, 赵静, 杨乐 (910)
- 近 80 年来中国大陆地区人口密度分界线变化 胡璐璐, 刘亚岚, 任玉环, 宇林军, 曲畅 (928)

技术方法

- 基于高度计遥感数据的北太平洋中尺度涡提取 毕经武, 董庆, 薛存金, 徐跃通 (935)
- 航空遥感数据典型自然下垫面偏振特性分析 舒存铭, 孙晓兵, 王涵, 龚冠源 (947)
- 高光谱目标探测中的空间和光谱尺度效应 石婷婷, 张立福, 岑奕, 孙雪剑, 高英倩, 童庆禧 (954)
- 单窗算法结合 Landsat 8 热红外数据反演地表温度 胡德勇, 乔琨, 王兴玲, 赵利民, 季国华 (964)
- NPP VIIRS 数据反演气溶胶光学厚度 苏城林, 苏林, 陈良富, 贾松林, 刘聪, 余超 (977)
- 基于形态学的海冰外缘线自动提取 王维波, 苏洁 (990)

遥感应用

- 星地多源数据的区域土壤有机质数字制图 周银, 刘丽雅, 卢艳丽, 马自强, 夏芳, 史舟 (998)
- 柑橘植株冠层氮素和光合色素含量近地遥感估测
..... 刘雪峰, 吕强, 何绍兰, 易时来, 谢让金, 郑永强, 胡德玉, 汪志涛, 邓烈 (1007)
- PALSAR 和 ASAR PSI 显著地表沉降探测与分析
..... 唐嘉, 刘国祥, 宋云帆, 陈巍, 于冰, 吴松波, 张瑞, 邓琳 (1019)
- 1973 年—2013 年经济特区城市空间扩展遥感监测
..... 施利锋, 张增祥, 刘芳, 赵晓丽, 刘斌, 徐进勇, 胡顺光 (1030)

JOURNAL OF REMOTE SENSING

(Vol. 19 No. 6 November , 2015)

CONTENTS

Review

- New vision in remote sensing applications under cross time and space remote sensing theory
..... LU Jingxuan, SONG Wenlong, QU Wei, FU Jun'e (881)
- Definition and application of GNSS-R observation patterns
..... WAN Wei, LI Huang, HONG Yang, CHEN Xiuwan, PENG Xuefeng (893)
- Advances in canopy radiation and scattering characteristic three-dimensional joint simulation models
..... ZHANG Yang, LIU Qinhua, QIN Wenhua,
LIU Qiang, LI Jing, DU Yongming, XIE Donghui, HUANG Huaguo, YANG Le, NI Wenjian (909)

Fundamental Research

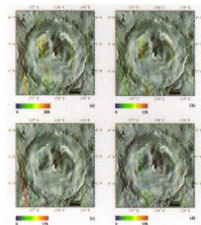
- Spatial representativeness estimation of station observation in validation of LAI products: A case study with
CERN in-situ data
..... XU Baodong, LI Jing, LIU Qinhua, ZENG Yelu, YIN Gaofei, ZHAO Jing, YANG Le (926)
- Spatial change of population density boundary in mainland China in recent 80 years
..... HU Lulu, LIU Yalan, REN Yuhuan, YU Linjun, QU Chang (934)

Technology and Methodology

- Extraction algorithm applied to northern Pacific mesoscale eddies based on altimetric remotely sensed data
..... BI Jingwu, DONG Qing, XUE Cunjin, XU Yuetong (946)
- Polarization properties of typical underlying nature surface based on airborne remote sensing data
..... SHU Cunming, SUN Xiaobing, WANG Han, GONG Guanyuan (953)
- Effects of spatial and spectral scale on hyperspectral target detection
..... SHI Tingting, ZHANG Lifu, CEN Yi, SUN Xuejian, GAO Yingqian, TONG Qingxi (963)
- Land surface temperature retrieval from Landsat 8 thermal infrared data using mono-window algorithm
..... HU Deyong, QIAO Kun, WANG Xingling, ZHAO Limin, JI Guohua (975)
- Retrieval of aerosol optical depth using NPP VIIRS data
..... SU Chenglin, SU Lin, CHEN Liangfu, JIA Songlin, LIU Cong, YU Chao (982)
- Sea ice edge automatic retrieval based on morphology WANG Weibo, SU Jie (983)

Remote Sensing Applications

- Regional scale mapping of soil organic matter using remote sensing and visible-near infrared spectroscopy
..... ZHOU Yin, LIU Liya, LU Yanli, MA Ziqiang, XIA Fang, SHI Zhou (1005)
- Estimation of nitrogen and pigments content in citrus canopy by low-altitude remote sensing
..... LIU Xuefeng, LYU Qiang,
HE Shaolan, YI Shilai, XIE Rangjin, ZHENG Yongqiang, HU Deyu, WANG Zhitao, DENG Lie (1017)
- Significant subsidence detection and analysis by PALSAR and ASAR PSI TANG Jia,
LIU Guoxiang, SONG Yunfan, CHEN Wei, YU Bing, WU Songbo, ZHANG Rui, DENG Lin (1029)
- Spatial expansion remote sensing monitoring of special economic zones from 1973 to 2013
..... SHI Lifeng, ZHANG Zengxiang, LIU Fang, ZHAO Xiaoli, LIU Bin, XU Jinyong, HU Shunguang (1039)



封面说明

About the Cover

火星Gale撞击坑含水矿物丰度反演

Hydrous minerals abundance of Gale crater on Mars

封面图片为基于火星 CRISM 高光谱数据反演的 Gale 撞击坑区域蛇纹石丰度图 (a)、葡萄石丰度图 (b)、蒙脱石丰度图 (c) 和阳起石丰度图 (d)，这 4 种矿物为该地区丰度相对较高的含水矿物。含水矿物主要分布在 Gale 撞击坑的西北侧，总丰度约为 20%—40%。图中白色方框为“好奇号”着陆区域，黄色五角星为着陆点。由于火星表面含水矿物具有分布零散、含量低且背景矿物未知或不确定的特点，丰度反演采用先目标识别后光谱解混的策略，即光谱库支持下的稀疏解混仅对含水矿物识别区进行，降低光谱解混的误差，提高了运算效率及结果的合理性。含水矿物的丰度信息有助于理解火星含水矿物的形成条件、分析火星地质演化过程。

The cover image presents the abundance map of serpentine (a), the abundance map of prehnite (b), the abundance map of smectite (c) and the abundance map of actinolite(d), which were retrieved with CRISM hyper spectral images at Gale crater on Mars. The white rectangle is the area around the MSL landing site (yellow star).These four minerals are among the most abundant hydrous minerals at Gale crater. It shows the hydrous minerals are concentrated in the northwestern part of Gale crater, and the abundance is about 20%–40%. Quantitative abundance information will yield strong contribute to find out the formation conditions of the hydrous minerals and the geological evolution of Mars. Martian hydrous minerals have relatively low concentration and scattered distribution. In addition, background minerals of hydrous minerals on Mars are not clear or are unknown. So, hydrous minerals extraction was performed using the spectral features of water absorption before spectral unmixing. This abundance retrieval strategy for the extracted regions , which uses the sparse unmixing based on spectral library, makes the spectral unmixing results reasonable while also reduces computation time.

主 管	中国科学院	Superintended	by	Chinese Academy of Sciences
主 办	中国科学院遥感与数字地球研究所 中国地理学会环境遥感分会	Sponsored	by	Institute of Remote Sensing and Digital Earth,CAS The Associate on Environment Remote Sensing of China
主 编	顾行发	Editor-in-Chief		GU Xing-fa
编 辑	《遥感学报》编委会 北京市朝阳区大屯路中国科学院遥感与数字地球研究所 邮编：100101 电话：86-10-64806643 http://www.jors.cn E-mail: jrs@radi.ac.cn	Edited	by	Editorial Board of Journal of Remote Sensing Add: P.O.Box 9718, Beijing 100101, China Tel: 86-10-64806643 http://www.jors.cn E-mail: jrs@radi.ac.cn
出 版	科学出版社	Published	by	Science Press
印刷装订	北京科信印刷有限公司	Printed	by	Beijing Kexin Printing Co. Ltd.
总 发 行	科学出版社 北京东黄城根北街16号 国内邮发代号：82-324 邮政编码：100717 电话：86-10-64017032 E-mail:sales_journal@mail.sciencep.com	Distributed	by	Science Press Add: 16 Donghuangchenggen North Street, Beijing 100717, China Tel: 86-10-64017032 E-mail: sales_journal@mail.sciencep.com
国外发行	中国国际图书贸易总公司 北京 399 信箱 邮政编码：100044 国外发行代号：BM 1002	Overseas distributed	by	China International Book Trading Corporation Add: P.O.Box 399, Beijing 100044, China

中国标准连续出版物号：ISSN 1007-4619
CN 11-3841/TP

CODEN YXAUAB

定价：70.00元



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ISSN 1007-4619



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