



तकनीकी पत्रिका विषय-सूची

CURRENT CONTENT

(Technical Journals)

(A Monthly Current Awareness Service from Technical Journals)

Vol.4 No.11, November, 2020

The Central Library, IBM, Nagpur is subscribing the technical journals and also receiving them on complimentary basis on various subjects like Geology, Mining, Mineral Economics etc. These Technical Journals make up an important collection of latest scientific information. The library is rendering Reference Service to its users from these technical Journals (Article Indexing is one of them). Central Library, IBM provides Current Content Service from these technical journals in the name of “GEM” since 2006 on half yearly basis in print form. To expand this service to the IBM Offices all over India i.e. H.Q., Zonal & Regional Offices and to take a call of time, the Controller General, IBM desired to make this service online on monthly basis. The library staff made efforts to make it successful. This is the 11th issue of Volume-4 for this service named “तकनीकी पत्रिका विषय - सूची” (Current Content- A Monthly Current Awareness Service from Technical Journals) Vol.4 No.11, November 2020.

It will be highly appreciated if the valuable feedback is reciprocated. If some article as per content list is found to be of use by the reader the same may be requested and the library will send the scanned copy of the article to the interested reader.

Mrs R S Wakode
Sr.Library & Information Assistant
In-Charge,Central Library
library@ibm.gov.in
0712-2562847
Ext. 1210 , 1206

I N D E X

<u>S.No</u>	<u>Title</u>	<u>Page No</u>
1)	Iron & Steel Review	3-6
2)	Journal of Indian Society of Remote Sensing	7-11
3)	Journal of Mines Metals & Fuels	12

Iron & Steel Review, Vol.64 No.3, August 2020

Features

Editor & Publisher:

Santosh Mahanti

Directors:

Sabita Mahanti

Abhishek Mahanti

Director & Content Strategist:

Kritika Mahanti

Editorial:

Anindita Banerjee

Megha Ghosh

Marketing:

Shyamalendu Banerjee

Angan Chatterjee

Design & Layout:

Dipak Adhikari

Sambaran Karmakar

Editorial & Corporate Office:

Merlin Links, Block 5E/5F, 5th Floor

166B, S. P. Mukherjee Road

Kolkata - 700 026

Phone: 91-033-2465-8581/9406

Fax: 91-033-2465-3790

E-mail: isinfo@eth.net

contact@isinfoindia.in

Website: www.isinfoindia.com

Registered Office:

10, Chowringhee Road

Kolkata - 700 013

Subscription Rate

Domestic

₹ 10,800 (Yearly)

₹ 950 (Single Copy)

Overseas

\$ 1200 (Yearly)

€ 1200 (Yearly)

- 5 % GST on advertisement as applicable

Owned & Printed by Santosh Mahanti
at M/s. Gupta Quick Printers
4D/28, Dharmatalla Road
Kolkata - 700 039
and published by him from
10, Chowringhee Road
Kolkata - 700 013, India.

*Reproduction of matter published
here, in whole or in parts, is
prohibited without written
permission from the publisher.*

*The publisher and printer do not
accept any responsibility for
statements, data and opinions
expressed by the author.*



Cover Courtesy: RHI Magnesita

Refractory Special

18

Refractories for Atmanirbhar Bharat

National Trends

62

SAIL achieves highest-ever sales performance in July

Global Trends

78

SAIL-RSP sets a national record with the new BOF supplied by SMS group

Steel Market

94

Iron & Steel Summary for July 2020

Steel Technology

101

Transition from Integrated to Electrical Steelmaking Process Route

The Importance of Secondary Metallurgy

Statistics

109

Indian Steel Market & Prices - June 2020



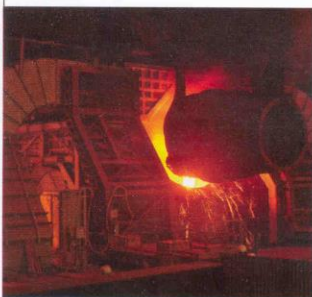
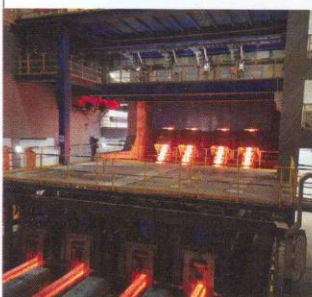
Contd...

Iron & Steel Review, Vol.64 No.3, August 2020

Features



Advertisers' Index



A	Kailash Marketing Associates	57
ABB	M	
Almatis Alumina Private Limited	Mipalloy Nomura Plating Company LLP	95
Atomat Group	MOIL Limited	85
Arcum Engineering Pvt. Ltd.	Maxis Motion Controls Pvt. Ltd.	99
Aman Machine Tools Pvt. Ltd.	Maithan Ceramic Limited	61
ARB Bearing Ltd.	N	
Amtec Hydracamp	NMDC Limited	63
B	O	
Beck u. Kalthener	Orind Special Refractories (P) Ltd.	58
C	P	
Creative Chemicals	Paul Wurth	Back Cover
Creative Carbon Pvt. Ltd.	Premier Refractories of India Pvt. Ltd.	51
Calderys	R	
D	RHI	19
Dalmia-OCI Refractories Limited	Refratechnik	48-49
Danieli Corus India Pvt. Ltd.	Ranchi Refractories	53
Danieli Spa	RINL	81
E	S	
Electrotherm (India) Limited	Subscription Form	4
Eastern Equipment & Engineers P. Ltd.	SMS group	7
G	Shandong Mingren Heavy Machinery Co. Ltd.	69
Gita Refractories Pvt. Ltd.	Shree Ram Mintech Pvt. Ltd.	79
GSB Refractories India Pvt. Ltd.,	T	
H	TVQ Coke Oven Consultants (P) Ltd.	77
Hi-Tech Chemicals (P) Ltd.	Transformers & Rectifiers (India) Ltd.	17
H & K Rolling Mill Engineers Pvt. Ltd.	Totale Global Pvt. Ltd.	73
Hindalco Chemicals	TRL Krosaki Refractories Limited	21
I	thyssenkrupp	75
Indiana Machine Tools	V	
Indrox Global Pvt. Ltd.	Vezzani	31
Intocast AG	Velco GmbH	37
J		
Jindal Steel & Power Limited		
K		
Khemka Refractories Private Limited		

Iron & Steel Review, Vol.64 No.4, September 2020

Features

Editor & Publisher:
Santosh Mahanti

Directors:
Sabita Mahanti
Abhishek Mahanti

Director & Content Strategist:
Kritika Mahanti

Editorial:
Anindita Banerjee
Megha Ghosh

Marketing:
Shyamalendu Banerjee
Angan Chatterjee

Design & Layout:
Dipak Adhikari
Sambaran Karmakar

Editorial & Corporate Office:
Merlin Links, Block 5E/5F, 5th Floor
166B, S. P. Mukherjee Road
Kolkata - 700 026
Phone: 91-033-2465-8581/9406
Fax: 91-033-2465-3790
E-mail: isrinfo@eth.net
contact@isrinformedia.in
Website: www.isrinformedia.com

Registered Office:
10, Chowringhee Road
Kolkata - 700 013

Subscription Rate

Domestic
₹ 10,800 (Yearly)
₹ 950 (Single Copy)

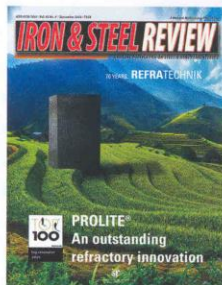
Overseas
\$ 1200 (Yearly)
€ 1200 (Yearly)

● 5 % GST on advertisement as applicable

Owned & Printed by Santosh Mahanti
at M/s. Gupta Quick Printers
4D/28, Dharmatalla Road
Kolkata - 700 039
and published by him from
10, Chowringhee Road
Kolkata - 700 013, India.

*Reproduction of matter published
here, in whole or in parts, is
prohibited without written
permission from the publisher.*

*The publisher and printer do not
accept any responsibility for
statements, data and opinions
expressed by the author.*



Cover Courtesy: Refrachtechnik Group

Cover Story

16

PROLITE®: An outstanding refractory innovation

Special Feature

18

Transition towards Green Steel Production in Indian Steel Sector

National Trends

32

SAIL achieves best-ever August sales performance

Global Trends

40

SMS group commissions No. 2 shearing line of Jiangsu Shagang Group

Focus

49

Innovations in Coal Gasification for Heating Applications

Interview

52



"We have been contributing to the Hon'ble Prime Minister's Atmanirbhar Bharat Abhiyaan since 1985"



"Our future path is to get into raw material processing and build up cost leadership"

Steel Market

56

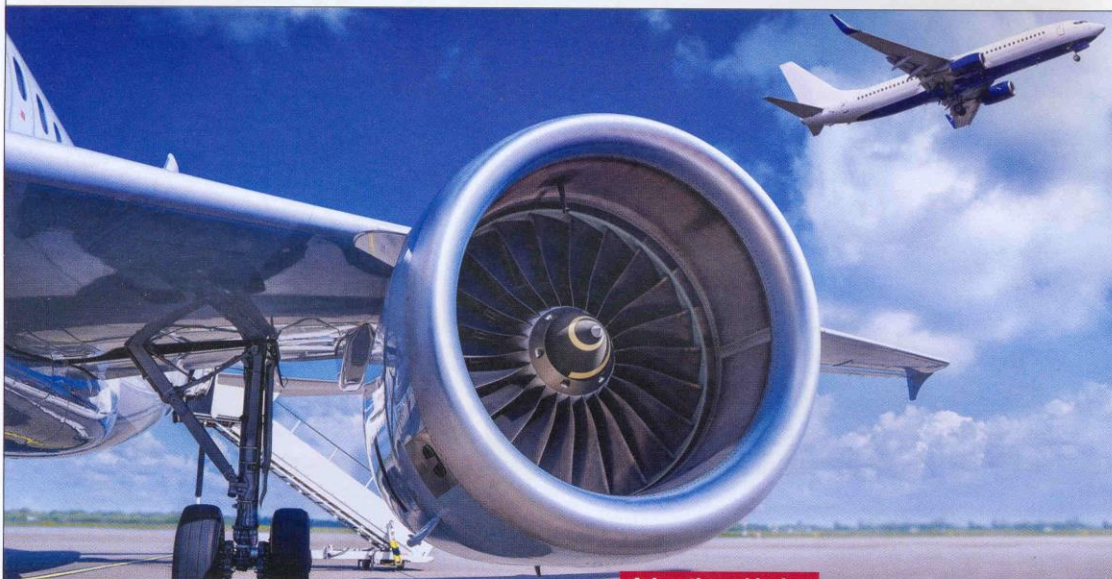
Iron and Steel Industry Performance in July 2020: A Report



Contd...

Iron & Steel Review, Vol.64 No.4, September 2020

Features



Advertisers' Index

Market/Product

67

**Right Method Right Place:
Which Metals Analysis
Method is Best at Each Stage
of EAF Steel Manufacturing?**

Steel Technology

72

**MIDA Hybrid: A New
Milestone Solar-Powered by
Danieli**

Refractory

75

**Auto Flux Feeder and Robotic
Arm for Steel Casting Flux
Feeding**

Statistics

87

**World Crude Steel & Iron
Production - July 2020**

**Indian Steel Market & Prices
- July 2020**

A

ABB	21
Atomat Group	39
Aman Machine Tools Pvt. Ltd.	10
ARB Bearing Ltd.	59

C

Creative Carbon Pvt. Ltd.	27
Calderys	Back Cover

D

Dalmia-OCL Refractories Limited	Second Cover
Dev Technofab Limited	51
Doshi Technologies (P) Ltd.	65
Danieli & C Spa	46-47

E

Electrotherm (India) Limited	7
Eastern Equipment & Engineers P. Ltd.	43

G

Gita Refractories Pvt. Ltd.	13
----------------------------------	----

H

Hi-Tech Chemicals (P) Ltd.	85
H & K Rolling Mill Engineers Pvt. Ltd.	11

I

Indiana Machine Tools	8
ISR Digital Ad	14
IMS Maco Services PVT. LTD.	95

J

Jindal Steel & Power Limited	37
------------------------------------	----

K

KOCKS	25
-------------	----

M

Mipalloy Nomura Plating Company LLP	61
Maud Transmission Machinery (Shanghai) Co., Ltd.	Third Cover
MOIL Limited	89
Maxis Motion Controls Pvt. Ltd.	91
Maitan Ceramic Limited	81

N

NMDC Limited	31
--------------------	----

O

Orind Special Refractories (P) Ltd.	83
--	----

R

R. Singh & Associates (P) Ltd.	93
Refratechnik Group	Cover
Refratechnik Steel	68-69
RINL	29

S

Subscription Form	12
SMS group	5
SGS Technologies	35
Sarvan Carbochem LLP	63
SAIL	23
Shyam Steel Industries Limited	15

T

TVQ Coke Oven Consultants (P) Ltd.	35
Transformers & Rectifiers (India) Ltd.	9
TRL Krosaki Refractories Limited	79

Z

Zumbach	77
---------------	----

Journal of the Indian Society of Remote Sensing, Vol.48 No.1, January 2020

Remote Sensing

Volume 48 · Number 1 · January 2020

RESEARCH ARTICLES

An Estimation of Hydrometeorological Drought Stress over the Central Part of India using Geo-information Technology

A. Kundu · N.R. Patel · D.M. Denis · D. Dutta 1

Application of Sentinel-1 Data to Estimate Height and Biomass of Rice Crop in Astaneh-ye Ashrafiyeh, Iran
A. Sharifi · M. Hosseingholizadeh 11

Spectral Characteristics and the Study of Pollution Degree of Maize Leaves Under Copper and Lead Stress
C. Zhang · K. Yang · Y. Li · F. Cheng · K. Rong 21

The Study of Morphological Characteristics for Best Management Practices Over the Rampur Watershed of Mahanadi River Basin Using Prioritization
P. Gunjan · S.K. Mishra · A.K. Lohani · S.K. Chandniha 35

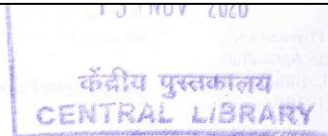
Estimating the Pollution Level Based on Heavy Metal Concentration in Water Bodies of Tiruppur District
A. Rajesh · G.W. Jiji · J.D. Raj 47

Modeling Biophysical Variables and Land Surface Temperature Using the GWR Model: Case Study—Tehran and Its Satellite Cities
Z. Alibakhshi · M. Ahmadi · M. Farajzadeh Asl 59

Comparing Support Vector Machines and Maximum Likelihood Classifiers for Mapping of Urbanization
B. Rimal · S. Rijal · R. Kunwar 71

Land Use and Cover Change Assessment and Dynamic Spatial Modeling in the Ghara-su Basin, Northeastern Iran
S. Joorabian Shooshtari · T. Silva · B. Raheli Namin · K. Shayesteh 81

Spatial Resolution Effect of Remotely Sensed Data on Flood Hydrograph Simulation
J. Chezgi · M. Vafakhah · S. Falahatkar 97



Automated Extraction of Slum Built-up Areas from Multispectral Imageries

S. Dahiya · P.K. Garg · M.K. Jat 113

Effect of Temperature and Precipitation on the Vegetation Dynamics of High and Moderate Altitude Natural Forests in India
O.I. Al Balasmeh · T. Karmaker 121

Land Cover/Land Use Mapping of LISS IV Imagery Using Object-Based Convolutional Neural Network with Deep Features
S. Rajesh · T.G. Nisia · S. Arivazhagan · R. Abisekaraj 145

Assessment of Land Cover Change in Selected Municipalities and Cities of Nueva Ecija Using Geographic Information System and Remote Sensing Technologies
A.M.P. Alberto · E.E. Camaso · E. Bulaong · K. Mapanao 155

MODIS Brightness Temperature Change-Based Forest Fire Monitoring
F. Parto · M. Saradjian · S. Homayouni 163

Further articles can be found at link.springer.com

Abstracted/Indexed in Science Citation Index Expanded (SciSearch), Journal Citation Reports/Science Edition, SCOPUS, INSPEC, Google Scholar, CSA, Academic OneFile, ASFA, Expanded Academic, Geobase, Indian Science Abstracts, OCLC, SCImago, Summon by ProQuest

Instructions for Authors for *J Indian Soc Remote Sens* are available at <http://www.springer.com/12524>

Journal of the Indian Society of Remote Sensing, Vol.48 No.2, February 2020

Remote Sensing

Volume 48 · Number 2 · February 2020

COVER ARTICLE

How to Specify an Electro-optical Earth Observation Camera? A Review of the Terminologies Used and its Interpretation
G. Joseph 171

RESEARCH ARTICLES

Detection and Analysis of Coal Fire in Jharia Coalfield (JCF) Using Landsat Remote Sensing Data
R.K. Mishra · J.K. Pandey · J. Pandey · S. Kumar · P.N.S. Roy 181

Developing an Interpretation System for High-Resolution Remotely Sensed Images Based on Hybrid Decision-Making Process in a Multi-scale Manner
A. Kiani · F. Farnood Ahmadi · H. Ebadi 197

An Improved Image Registration Method Using E-SIFT Feature Descriptor with Hybrid Optimization Algorithm
R. Swathi · A. Srinivas 215

Characterizing Distribution of Forest Fires in Myanmar Using Earth Observations and Spatial Statistics Tool
A. Unnikrishnan · C.S. Reddy 227

Urban Built-Up Area Estimation and Change Detection of the Occupied West Bank, Palestine, Using Multi-temporal Aerial Photographs and Satellite Images
A. Ghodieh 235

Identification of Sugarcane with NDVI Time Series Based on HJ-1 CCD and MODIS Fusion
Y. Chen · L. Feng · J. Mo · W. Mo · M. Ding · Z. Liu 249

Tempo-Spatial Behavior of Surface Urban Heat Island of Isfahan Metropolitan Area
M. Montazeri · S.A. Masoodian 263

The Space-Time Distribution of Soil Water and Temperature of a Desert Ecosystem Using Spatio-Temporal Kriging and PCA Analysis
J. Cui 271

Object-Based Mapping of Plastic Greenhouses with Scattered Distribution in Complex Land Cover Using Landsat 8 OLI Images: A Case Study in Xuzhou, China
L. Ji · L. Zhang · Y. Shen · X. Li · W. Liu · Q. Chai · R. Zhang · D. Chen 287

GIS-Based Multi-criteria Evaluation for Deciphering of Groundwater Potential
I. Ahmad · M.A. Dar · T.G. Andualem · A.H. Tekla · A.T. Tolosa 305

Analysis and Integration of Surface and Subsurface Information of Different Bridges
S.K.P. Kushwaha · S. Raghavendra · H. Pande · S. Agrawal 315

Impact of Climate on the NDVI of Northern Mongolia
B. Enebish · D. Dashkhoo · M. Renchin · M. Russell · P. Singh 333

Further articles can be found at link.springer.com

Abstracted/Indexed in Science Citation Index Expanded (SciSearch), Journal Citation Reports/Science Edition, SCOPUS, INSPEC, Google Scholar, CSA, Academic OneFile, ASFA, Expanded Academic, Geobase, Indian Science Abstracts, OCLC, SCImago, Summon by ProQuest

Instructions for Authors for *J Indian Soc Remote Sens* are available at <http://www.springer.com/12524>



ISRS

केंद्रीय पुस्तकालय
CENTRAL LIBRARY

Journal of the Indian Society of Remote Sensing, Vol.48 No.3, March 2020

Remote Sensing

Volume 48 · Number 3 · March 2020

केंद्रीय पुस्तकालय
CENTRAL LIBRARY



ISRS

RESEARCH ARTICLES

Historical Photograph Orthorectification Using SfM for Land Cover Change Analysis

R. Ma · M. Broadbent · X. Zhao 341

Water Pollution Classification in Tiruppur District Using Unsupervised Fully Constrained Least-Squares Method

G.W. Jiji · A. Rajesh · P.J. Durai Raj 353

The Monitoring of the Pollution Degree of Maize Under Copper Stress

C. Zhang · K. Yang · K. Rong · F. Cheng · Y. Li 363

HSI Model-Based Image Dehazing for Remote Sensing Images

N.A. Bibi · C. Vasanthanayaki 373

Spatial Resolution Enhancement Mapping of Hyperspectral Image via Pixel Filling Algorithm

N. Prabhu · M.K. Arora · R. Balasubramanian 385

Desertification Hazard Zonation in Central Iraq Using Multi-criteria Evaluation and GIS

T.H. Shihab · A.N. Al-hameedawi 397

Prediction Mapping Through Maxent Modeling Paves the Way for the Conservation of *Rhododendron arboreum* in Uttarakhand Himalayas

M.S. Bhandari · R.K. Meena · R. Shankhwar · C. Shekhar · J. Saxena · R. Kant · V.V. Pandey · S. Barthwal · S. Pandey · G. Chandra · H.S. Ginwal 411

Identification of Paddy Stubble Burnt Activities Using Temporal Class-Based Sensor-Independent Indices Database: Modified Possibilistic Fuzzy Classification Approach

A. Singh · A. Kumar 423

Landslide Susceptibility Mapping Using Landslide Numerical Risk Factor Model and Landslide Inventory Prepared Through OBIA in Chenab Valley, Jammu and Kashmir (India)

A.S. Patil · B.K. Bhadra · S.S. Panhalkar · P.T. Patil 431

Comparative Analysis of Different Methods for Extracting Water Body Area of Miyun Reservoir and Driving Forces for Nearly 40 Years

Y. Lai · J. Zhang · Y. Song · Y. Cao 451

Growth and Decay of High-Biomass Algal Bloom in the Northern Arabian Sea

A.A. Lotliker · S.K. Baliarsingh · A. Samanta · V. Varaprasad 465

Watersheds Characteristics and Prioritization Using Morphometric Parameters and Fuzzy Analytical Hierarchal Process (FAHP): A Part of Lower Subansiri Sub-Basin

F. Sangma · B. Guru 473

Identification of Groundwater Potential Zones Using RS, GIS and AHP Techniques: A Case Study in a Part of Deccan Volcanic Province (DVP), Maharashtra, India

V. Ajay Kumar · N.C. Mondal · S. Ahmed 497

Semiautomatic Road Extraction Framework Based on Shape Features and LS-SVM from High-Resolution Images

P.K. Soni · N. Rajpal · R. Mehta 513

Further articles can be found at link.springer.com

Abstracted/Indexed in Science Citation Index Expanded (SciSearch), Journal Citation Reports/Science Edition, SCOPUS, INSPEC, Google Scholar, CSA, Academic OneFile, ASFA, Expanded Academic, Geobase, Indian Science Abstracts, OCLC, SCImago, Summon by ProQuest

Instructions for Authors for *J Indian Soc Remote Sens* are available at <http://www.springer.com/12524>

 Springer

Journal of the Indian Society of Remote Sensing, Vol.48 No.6, June 2020

Remote Sensing

Volume 48 · Number 6 · June 2020



ISRS

RESEARCH ARTICLES

Suburban Building Detection from Optical Remote Sensing Images Based on a Deformation Adaptability Model

F. Bi · J. Zhang · F. Pang · M. Bian · Y. Wang 831

Application of Unmanned Aerial Vehicle for Mapping and Modeling of Indian Mines

J. Leo Stalin · R.C.P. Gnanaprakasam 841

Estimation of Forest Variable and Aboveground Biomass using Terrestrial Laser Scanning in the Tropical Rainforest

S.M. Beyene 853

High-Resolution Mapping of Forest Carbon Stock Using Object-Based Image Analysis (OBIA) Technique

S.K. Pandey · N. Chand · S. Nandy · A. Muminov · A. Sharma · S. Ghosh · R. Srinet 865

Evaluation of Classification Techniques for Land Use Change Mapping of Indian Cities

V. Avashia · S. Parihar · A. Garg 877

An Analysis of Urban Sprawl and Prediction of Future Urban Town in Urban Area of Developing Nation: Case Study in India

Md. Hasnine · Rukhsana 909

Assessment of Agricultural Drought in Upper Seonath Sub-Basin of Chhattisgarh (India) Using Remote Sensing and GIS-Based Indices

H. Sarkar · S. Soni · I. Ahmad · M.K. Verma 921

Development of an Automated Tool for Delineation of Flood Footprints from SAR Imagery for Rapid Disaster Response: A Case Study

S.K. Kuntla · P. Manjusree 935

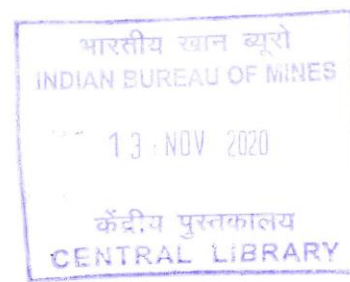
Multispectral to Panchromatic Image Fusion Based on Morphological Extended-Half-Gradient

V.R. Pandit · R.J. Bhiwani 945

CORRECTION

Correction to: Automatic Detection of Shoreline Change by Geographical Information System (GIS) and Remote Sensing in the Seyhan Delta, Turkey

D. Ciritci · T. Türk 959



Further articles can be found at link.springer.com

Abstracted/Indexed in Science Citation Index Expanded (SciSearch), Journal Citation Reports/Science Edition, SCOPUS, INSPEC, Google Scholar, CSA, Academic OneFile, ASFA, Expanded Academic, Geobase, Indian Science Abstracts, OCLC, SCImago, Summon by ProQuest

Instructions for Authors for *J Indian Soc Remote Sens* are available at <http://www.springer.com/12524>

Journal of the Indian Society of Remote Sensing, Vol.48 No.7, July 2020

Remote Sensing

Volume 48 · Number 7 · July 2020



ISRS

RESEARCH ARTICLES

Detection of Multidimensional Poverty Using Luojia 1-01 Nighttime Light Imagery

C. Li · W. Yang · Q. Tang · X. Tang · J. Lei · M. Wu · S. Qiu 963

Application of Remote Sensing and GIS in Performance Evaluation of Irrigation Project at Disaggregated Level

B.R. Nikam · V. Garg · P.K. Thakur · S.P. Aggarwal 979

COVID-19 Pandemic and City-Level Nitrogen Dioxide (NO₂) Reduction for Urban Centres of India

A. Siddiqui · S. Halder · P. Chauhan · P. Kumar 999

Identification of Remote Sensing-Based Land Cover Types Combining Nearest-Neighbor Classification and SEaTH Algorithm

J. Zhao · Y. Fang · M. Zhang · Y. Dong 1007

Urban Sprawl Evaluation Using Landscape Metrics and Black-and-White Hypothesis (Case Study: Urmia City)

A. Abedini · A. Khalili · N. Asadi 1021

Relationship Between Field Measurement of Soil Moisture in the Effective Depth of Sugarcane Root Zone and Extracted Indices from Spectral Reflectance of Optical/Thermal Bands of Multispectral Satellite Images

S. Veysi · A.A. Naseri · S. Hamzeh 1035

Investigation of Spatiotemporal Changes in the Incidence of Traffic Accidents in Kahramanmaraş, Turkey, Using GIS-Based Density Analysis

M. Özcan · M. Küçükönder 1045

Decreasing Downstream Channel Capacity of a Low-Lying Ephemeral River of Bengal Basin, Eastern India

S. Malik · S.C. Pal 1057

Obtaining Height Information Using a 2-D Top View UAV Image with the Help of Spherical Astronomy

S. Selim · M. Kalaycı · A. Kılçık 1083

SHORT NOTE

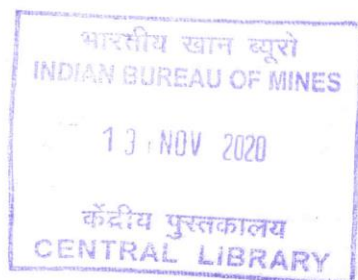
Extraction of Four Types of Urban Ground Objects Based on a Newly Created WorldView-2 Multi-colour Spectral Index

H. Liu · H. An 1091

Further articles can be found at link.springer.com

Abstracted/Indexed in Science Citation Index Expanded (SciSearch), Journal Citation Reports/Science Edition, SCOPUS, INSPEC, Google Scholar, CSA, Academic OneFile, ASFA, Expanded Academic, Geobase, Indian Science Abstracts, OCLC, SCImago, Summon by ProQuest

Instructions for Authors for *J Indian Soc Remote Sens* are available at <http://www.springer.com/12524>



 Springer

JOURNAL OF MINES, METALS & FUELS

INCORPORATING INDIAN MINING JOURNAL (II ISSN 0022-2755)

(FOUNDED BY LATE P.K. MENON)

Managing Editor:
Pradip Kumar Chanda

Honorary Editor in Chief:
Prof. Dr. Jayanta Bhattacharya, IIT Kharagpur, India, FNAE

International Editorial Advisory Board

Dr. Abdolhadi Ghazvianin
Fellow, ISRM, Tehran, Iran
Prof. Dr. Antonio V. Nieto
School of Mining Engineering,
University of Witwatersrand, South Africa
Prof. Dr. Arif Jamal,
Mining Engg., IIT (BHU), Varanasi, India
Prof. Dr. Ashis Bhattacharjee,
Mining Engineering, IIT, Kharagpur, India
Prof. Barun Kumar Nandi
Fuel & Mineral Engg, IIT/ISM, Dhanbad, India
Prof. Dr. Biswajit Samanta
Mining Engineering, IIT, Kharagpur, India
Prof. Dr. B S Sastry
Mining Engineering, IIT Kharagpur India
Prof. Dr. Edy Tonnizam Mohamad
Geotopik, University Teknologi Malaysia
Dr. Keka Ojha
Petroleum Engg, IIT/ISM, Dhanbad, India
Dr. Manis Kumar Jha
CSIR-National Metallurgical Laboratory,
Jamshedpur, India
Prof. Michael Tuck
Mining Engineering, Federation University,
Australia
Prof. Dr. Mitchel W. Hitch
Mining Engineering, Tallinn University of
Technology, Estonia
Prof. Dr. Mohan Yellishetty
Resources Engineering, Monash University,
Australia
Niraj Ranjan Sharma
Metals & Mining Industry, IBM Singapore
Dr. Prabhat Kumar Mandal
CSIR-CIMFR, Dhanbad, India
Prof. Dr. Ram Bhattacharya
Mining Engg, IIT/ISM, Dhanbad, India
Dr. R.M. Bhatwadekar
Training & Courses, Geotroik, Universiti
Teklogi, Malasiya
Dr. S.B. Srivastav
Geophysics, IIT/ISM, Dhanbad, India
Prof. Subodh Kumar Maiti
Environmental Science & Engineering,
IIT(ISM), Dhanbad, India
Prof. Supraksh Gupta
Mining Engg, IIT (BHU), Varanasi, India
Dr. Tanmoy Maity
Power Electronics & Drives, IIT/ISM,
Dhanbad, India
Dr. Vasyi Lozynski
Dnipro University of Technology, Ukraine
Dr. Victoria R. Nalule
Petroleum Engg, University of Dundee, UK



Vol.68, No.7, JULY 2020

THE CONTENTS

- Discussion-opinion-Editorial:* Why mining engineering education should create a place for its students in the schemes of renewable energy generation 219
- Industry Directions:* A look at future morphology of the mining industry 220
- Whole body vibration exposure and its effects on heavy earthmoving machinery (HEMM) operators of opencast mines – a review
by Anand S. Sharma, S. K. Mandal, G. Suresh, S. Oraon and D. Kumbhakar 221
- Optimal control of induction machines under minimum energy in opencast mining machinery
by Aveek Mangal 229
- Effect of cracks on the stability of dump slope
by Ashutosh Kumar Bharati, Arunava Ray, Rajesh Rai and B. K. Shrivastava 237
- Experimental studies for assessing spontaneous combustion risk of some Indian coals
by Arjun Kumar and D. P. Tripathy 243

Editorial & Business Offices:
Moon Plaza, 2A, 2nd Floor
62 Lenin Sarani, Taltala
Kolkata 700 013

Mobiles:
+91 9239384829 /
+91 8479919829
+91 9903463829 (Office)
E-mail: bnjournals@gmail.com
pradipchanda@yahoo.co.uk
web: www.jmmf.info

Registered Office:
Books & Journals Pvt. Ltd.
62 Lenin Sarani,
Kolkata 700 013

Enlist as a subscriber to:

INDIAN JOURNAL OF POWER & RIVER VALLEY DEVELOPMENT

A technical monthly devoted to
development of
power and water resources in Asia
Annual Subscription
(Effective January 2020)
Rs.3000 (India); €280.00 or \$400.00 (Foreign)

For advertisement rates

Write to:

The Manager
BOOKS & JOURNALS PRIVATE LTD.
Moon Plaza, (2A, 2nd Floor)
62 Lenin Sarani, Kolkata 700 013
E-mail: bnjournals@gmail.com

