

International Conference on Recent Trends in Geoscience Research and Applications 2023

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BOOK OF ABSTRACTS AND CONTRIBUTED PAPERS



Edited by Aleksandra Nina, Snežana Dragović, and Dejan Doljak



Belgrade
2023

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Scientific Rationale

Geoscience research and applications are of crucial interest in science and many areas of modern life. For this reason, exchanging knowledge in various relevant areas is essential for development in scientific, engineering and programming activities. The conference aims to highlight the importance of joint research of experts in these fields and provide a platform for knowledge exchange.

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UTILIZATION OF REMOTE SENSING AND NUCLEAR TECHNIQUES FOR DETAILED MODELING AND QUANTITATIVE ASSESSMENT OF GULLY EROSION WITHIN THE FORESTED AREA OF THE MALČANSKA RIVER BASIN, EASTERN SERBIA

Mrđan Đokić^{1}, Miloš Manić², Milan Đorđević¹, Milena Gocić¹, Aleksandar Čupić³, Mihajlo Jović³, Ranko Dragović¹, Boško Gajić⁴, Ivana Smičiklas³, Snežana Dragović³*

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The gully erosion is one of the most significant land degradation processes. Although gully erosion significantly threatens agricultural productivity and natural ecosystems, European land management strategies frequently need more reliable data on environmental conditions governing this process. This study presents a methodology that integrates remote sensing and nuclear techniques for examining gully erosion (Đokić et al., 2023). It introduces a novel approach to erosion research by employing 360-degree camera photogrammetry to characterize gullies morphometrically. The main objectives of this approach are to evaluate the applicability of unmanned aerial vehicles and terrestrial photogrammetry for modeling gullies, to study small-scale erosion processes within gullies, compare erosion intensity between adjacent gullies, and determine the most effective and cost-efficient method for monitoring gullies. A total of 39 soil samples were taken in three studied gullies. The results revealed an average soil redistribution rate of $16.2 \text{ t ha}^{-1} \text{ yr}^{-1}$ and coefficients of variation of 32%, 59%, and 91% for the gullies. The estimated erosion rate varies from a minimum of $0.1 \text{ t ha}^{-1} \text{ yr}^{-1}$ to a maximum of $34.3 \text{ t ha}^{-1} \text{ yr}^{-1}$. Soil deposition was identified at only two sampling sites, 1.1 and $2 \text{ t ha}^{-1} \text{ yr}^{-1}$. Highly detailed 3D models of the gullies were created using 360-degree photogrammetry. The micro-relief obtained through modeling proved to be an essential aspect of advanced erosion research.

Acknowledgements

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Nuclear Techniques in Food and Agriculture in providing equipment for gamma-ray spectrometry and UAV remote sensing within the project SRB5003.

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Đokić, M., Manić, M., Đorđević, M., Gocić, M., Čupić, A., Jović, M., Dragović, R., Gajić, B., Smičiklas, I., & Dragović, S. (2023). Remote sensing and nuclear techniques for high-resolution mapping and quantification of gully erosion in the highly erodible area of the Malčanska River Basin, Eastern Serbia. *Environmental Research*, 235, Article 116679. <https://doi.org/10.1016/j.envres.2023.116679>

PROGRAMME

Monday, 23 October

14:00 – 15:30 **Registration**

Chairs: Aleksandra Nina and Snežana Dragović

15:30 – 15:45 **Opening ceremony**

Chair: Bratislav Marinković

15:45 – 16:20 **Nigel John Mason** *Invited lecture*
COMPARATIVE PLANETOLOGY—WHAT DO WE LEARN ABOUT THE
EARTH BY STUDYING OTHER PLANETS?

16:20 – 16:45 **Mirela Voiculescu, Cătălina Iticescu, Constantin Apetrei, Maxim Arseni, Mădălina Călmuc, Valentina Călmuc, Daniel Constantin, Michaela Dobre, Adrian Roșu, Mihaela Timofti, Cătălina Țopa, Lucian P. Georgescu**
REXDAN—A NEW RESEARCH INFRASTRUCTURE WHOSE VESSEL
WILL SOON SAIL ON DANUBE

16:45 – 18:45 **Welcome cocktail**

Tuesday, 24 October

Chair: Snežana Dragović

9:00 – 9:35 **Vladica Cvetković** *Invited lecture*
LITHOSPHERE GEODYNAMICS INFERRED FROM STUDY OF MANTLE
XENOLITHS: THE EXAMPLE FROM SERBIA

9:35 – 10:00 **Ivan Lizaga, Borja Latorre, Montfort Bagalwa, Bossissi Nkuba, Kristof Van Oost, Pascal Boeckx**
UNVEILING CONFLICT HERITAGE: EXAMINING THE INFLUENCE OF
HUMAN CONFLICTS ON LAND DEGRADATION AND LANDSCAPE
MODIFICATION

10:00 – 10:25 **Nina Nikolova, Jelena Svetozarevic, Simeon Matev, Dimitar Krenchev, Rositsa Kenderova, Georgi Rachev**
RAINFALL EROSIVITY IN BULGARIA—SERBIA TRANSBORDER REGION

10:25 – 11:00 Coffee break

Chair: M. Y. Boudjada

11:00 – 11:35 **Rapoport Yuriy, Grimalsky Volodymyr, Petrishevskii Sergei, Grytsai Asen, Liaschuk Oleksandr, Frankowski Andrzej** *Invited lecture*
MODELLING WAVE STRUCTURES IN THE EARTH-ATMOSPHERE-
IONOSPHERE AND RADIODIAGNOSTICS OF IONOSPHERIC SPACE
WEATHER (ISW)

- 11:35 – 12:00 **Heba Salah Mohamed, Christine Amory-Mazaudier, Sampad Kumar Panda, Osama Mahmoud Shalabiea, Ayman Mohamed Mahrous**
 DELAYED RESPONSE OF LOW LATITUDES TEC DURING THIRTY-SIX GEOMAGNETIC STORMS FROM 2014 TO 2017
- 12:00 – 12:25 **Tamal Basak, Sayak Chakraborty** *Invited progress report*
 INVESTIGATING THE ALTITUDE PROFILE OF D-REGION IONOSPHERIC RESPONSE TIME DURING SOLAR FLARES
- 12:25 – 14:00 Lunch break
- Chair:** Maja Kuzmanoski
- 14:00 – 14:25 **Dharmendra Kumar Kamat, Som Kumar Sharma, Sourita Saha, Prashant Kumar, Kondapalli Niranjan Kumar**
 INVESTIGATION OF THE ATMOSPHERIC CLOUDS AND BOUNDARY LAYER OVER THE WESTERN-INDIAN REGION
- 14:25 – 14:50 **Irina Mironova**
 GEOMAGNETIC DISTURBANCE FORCING ON THE MIDDLE ATMOSPHERE
- 14:50 – 15:15 **Artem Padokhin, Elena Andreeva**
 MULTI-GNSS GLOBAL AND LOCAL IONOSPHERIC MAPPING UTILIZING EXCLUSIVELY PHASE OBSERVATIONS
- 15:15 – 15:45 Coffee break
- Chair:** Irina Mironova
- 15:45 – 16:10 **Maja Kuzmanoski, Zorica Podračanin, Ana Ćirišan, Zoran Mijić**
 AEROSOL VERTICAL PROFILES AND ABL HEIGHTS CORRESPONDING TO DIFFERENT PM₁₀ POLLUTION LEVELS IN BELGRADE, SERBIA
- 16:10 – 16:35 **Andrey Mironov, Vladimir Zubov, Eugene Rozanov**
 STUDY OF POLAR OZONE ANNUAL CYCLE WITH CCM SOCOL-3

Wednesday, 25 October

- Chair:** Artem Padokhin
- 11:00 – 11:25 **Ivica Milevski, Slavoljub Dragicevic, Bojana Aleksova**
 UAV-BAZED SURVEY OF THE NATURAL MONUMENT KUKLICA
- 11:25 – 11:50 **Klemen Medved, Božo Koler, Sofija Naod, Oleg Odalović**
 MODELING OF VERTICAL GRAVITY GRADIENT FOR PURPOSES OF GRAVIMETRIC SURVEY
- 11:50 – 12:15 **Sumesh Gopinath, Chakkalayil Parameswaran Anil Kumar, Prince Prasad Revamma, Sherin Ann Abraham, Soosaleon Antony**
 NON-EXTENSIVE TSALLIS ENTROPY ANALYSIS ON LONGTERM VARIATION OF JOULE HEATING AT HIGH LATITUDES
- 12:15 – 13:30 Lunch break
- 13:30 **Excursion**

Thursday, 26 October

Chair: Sergey Pulinets

- 9:00 – 9:35 **Pier Francesco Biagi** *Invited lecture*
A 50 YEARS RESEARCH ON EARTHQUAKE PRECURSORS: A PERSONAL EXPERIENCE
- 9:35 – 10:00 **Mohammed Y. Boudjada, Pier Francesco Biagi, Hans U. Eichelberger, Giovanni Nico, Patrick H. M. Galopeau, Maria Solovieva, Helmut Lammer, Bruno Besser, Manfred Stachel, Franz Giner**
INVESTIGATION OF VLF TRANSMITTER AMPLITUDE VARIABILITIES BEFORE THE M_w 7.8 TURKEY SYRIA EARTHQUAKES OF FEBRUARY 6, 2023
- 10:00 – 10:25 **Aleksandra Nina, Pier Francesco Biagi, Sergey Pulinets, Srđan Mitrović, Giovanni Nico, Luka Č. Popović**
NEW POTENTIAL EARTHQUAKE PRECURSOR: REDUCTION OF THE VLF SIGNAL NOISE
- 10:25 – 11:00 Coffee break

Chair: Pier Francesco Biagi

- 11:00 – 11:35 **Sergey Pulinets** *Invited lecture*
ENERGY TRANSFORMATION, RELEASE AND DISSIPATION DURING EARTHQUAKE PREPARATION PERIOD AS THE MANIFESTATION OF GEOSPHERE'S INTERACTION
- 11:35 – 12:00 **Giovanni Nico, Manilo Monaco, Pier Francesco Biagi, Anita Ermini, Aleksandra Nina**
ON THE DETECTION OF ANOMALIES IN TIME SERIES OF VLF SIGNALS RELATED TO SEISMIC ACTIVITY
- 12:00 – 12:10 **Meeting photo**
- 12:10 – 13:30 Lunch break

Chair: Giovanni Nico

- 13:30 – 13:55 **Hans U. Eichelberger, Mohammed Y. Boudjada, Konrad Schwingenschuh, Pier Francesco Biagi, Patrick H. M. Galopeau, Maria Solovieva, Christoph Schirninger, Bruno P. Besser, Manfred Stachel, Werner Magnes**
ANALYSES OF MAGNITUDE $M_w \geq 5.5$ EARTHQUAKES WITH SUB-IONOSPHERIC VLF/LF ELECTRIC FIELD MEASUREMENTS IN EUROPE
- 13:55 – 14:20 **Ljubcho Jovanov, Katerina Drogreshka, Jasmína Najdovska, Dragana Chernih**
HISTORICAL AND INSTRUMENTAL SEISMIC ACTIVITY OF THE SKOPJE EPICENTRAL AREA
- 14:20 – 15:30 **Posters**
- 20:00 – **Conference dinner**

Friday, 27 October

Chair: Hans Eichelberger

- 11:00 – 11:25 **Aleksandra Kolarski** Invited progress report
MODELING LOWER IONOSPHERIC RESPONSE TO LIGHTNING-INDUCED
ELECTRON PRECIPITATION USING VLF RADIO SIGNAL RECORDINGS
- 11:25 – 11:50 **Mario Batubara, Masa-yuki Yamamoto, Islam Hosni Hemdan
Eldedsouki Hamama, Thomas Djamaluddin, Timbul Manik,
Peberlin Parulian Sitompul, Musthofa Lathif, Poki Agung
Budiantoro, Ibnu Fathrio, Ednofri, Sutan Takdir Ali Munawar, Alit
Daryana, Parid Saparudin**
DEVELOPMENT OF A LOW-COST PORTABLE INFRASOUND AND
ENVIRONMENTAL ATMOSPHERIC DATA MEASUREMENT FOR
MONITORING GEOPHYSICAL PARAMETERS
- 11:50 – 12:15 **Violeta Vasilić, Ljiljana Brajović, Dušan Petković, Dragan Blagojević**
TROPOSPHERIC REFRACTION AND ITS INFLUENCE THROUGH ZENITH
TOTAL PATH DELAY AT DIFFERENT IGS STATIONS
- 12:15 – 12:30 **Concluding remarks and closing of the Conference**

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- P2. **Olimpia Masci**, **Giovanni Nico**, **Giuseppina Prezioso**
GROUND-BASED RADAR INTERFEROMETRY: EXAMPLES OF APPLICATION TO THE MONITORING OF LANDSLIDES AND INFRASTRUCTURE
- P3. **Aleksandra Nina**, **Vladimir Čadež**, **Luka Č. Popović**
IONOSPHERIC D-REGION DISTURBANCES INDUCED BY OUTER SPACE EVENTS
- P4. **Ivana Smičiklas**, **Marija Egerić**, **Mihajlo Jović**, **Snežana Dragović**
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- P5. **Filip Arnaut**, **Aleksandra Kolarski**
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- P6. **Gordana Jovanović**
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- P7. **Ana Milanović Pešić**, **Boško Milovanović**, **Milovan Milivojević**, **Milan Radovanović**
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- P8. **J. Arul Asir**, **H. Johnson Jeyakumar**, **C. P. Anil Kumar**
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- P9. **Bratislav P. Marinković**
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- P10. **Mrđan Đokić**, **Miloš Manić**, **Milan Đorđević**, **Milena Gocić**, **Aleksandar Čupić**, **Mihajlo Jović**, **Ranko Dragović**, **Boško Gajić**, **Ivana Smičiklas**, **Snežana Dragović**
UTILIZATION OF REMOTE SENSING AND NUCLEAR TECHNIQUES FOR DETAILED MODELING AND QUANTITATIVE ASSESSMENT OF GULLY EROSION WITHIN THE FORESTED AREA OF THE MALČANSKA RIVER BASIN, EASTERN SERBIA

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