INTERNATIONAL JOURNAL ON ORANGE TECHNOLOGY

https://journals.researchparks.org/index.php/IJOT e-ISSN: 2615-8140 | p-ISSN: 2615-7071
Volume: 5 Issue: 6 |Jun 2023

Analysis of Neutral Polarization Points

J.Roziqov,
Fergana state university, Uzbekistan.

A.Zokirov
Fergana state university, Uzbekistan.

----------***----------

Abstract: Neutral polarization points (NPPs) and land-atmosphere parameter separation (LAPS) are crucial concepts in remote sensing and atmospheric science. NPPs indicate locations where incoming light loses its polarization due to the absence of a preferential direction, such as on lunar soil. LAPS involves separating land surface parameters, including vegetation, soil moisture, and temperature, from atmospheric effects in remote sensing data. Accurate separation of these parameters is vital for precise remote sensing of Earth's surface and climate change assessment. This article discusses the principles of NPPs and LAPS, their applications in remote sensing, and their significance in atmospheric science.

Keywords: Neutral polarization points (NPPs), Land-atmosphere parameter separation (LAPS), Remote sensing, Climate change

Introduction

Neutral polarization points (NPPs) and land-atmosphere parameter separation (LAPS) are essential concepts in remote sensing and atmospheric science. NPPs refer to locations where the polarization state of the incoming light becomes unpolarized due to the absence of a preferential direction, such as in the case of lunar soil. LAPS, on the other hand, involves the separation of land surface parameters, such as vegetation, soil moisture, and temperature, from atmospheric effects in remote sensing data. The separation of these parameters is crucial for accurate remote sensing of the Earth's surface and the assessment of climate change. This article aims to discuss the principles of NPPs and LAPS, their applications in remote sensing, and their significance in atmospheric science.

2. Understanding Neutral Polarization Points

In addition to understanding the concept of neutral polarization points, knowledge of their location is also crucial. These points are not fixed, but vary with the time of day and observer location. However, they are typically located near the horizon and perpendicular to the plane of polarization of the incident radiation. The angle of polarization of the incident radiation is critical in determining the location of the neutral point, since it affects the amount of polarization rotation that occurs during transmission through the atmosphere. The location of the neutral point can be determined experimentally or through modeling techniques, but it is important to note that the accuracy of the results is highly dependent on factors such as atmospheric conditions and the accuracy of instrumental measurements. Therefore, a thorough understanding of neutral polarization points and their location is necessary for accurate land-atmosphere parameter separation.

https://journals.researchparks.org/index.php/IJOT e-ISSN: 2615-8140 | p-ISSN: 2615-7071
Volume: 5 Issue: 6 |Jun 2023

3. Land-Atmosphere Interaction and Parameter Separation Techniques

The study of land-atmosphere interaction and parameter separation techniques is critical in understanding the behavior of the Earth's climate system. The interaction between the land surface and the atmosphere plays a fundamental role in regulating the exchange of energy, water, and carbon dioxide between the two systems. Parameter separation techniques are used to quantify the individual contributions of each system to the overall exchange. These techniques are essential for understanding the role of vegetation in regulating the Earth's climate system and for improving our ability to make accurate predictions of future climate change. The use of neutral polarization points in land-atmosphere parameter separation represents a significant step forward in our understanding of this complex process, providing a new and innovative approach to data analysis that can improve the accuracy of our climate models.

4. Applications of Neutral Polarization Points in Remote Sensing

Neutral polarization points have found applications in remote sensing through their ability to separate land-atmosphere parameters. For example, in a multi-angular measurement, the location of the neutral point indicates the angle at which reflected light is polarized in the same way as the atmospheric scattering, therefore providing information on atmospheric properties. Additionally, the neutral point can be used to correct surface polarization effects in the presence of a scattering atmosphere. This is of great importance in the remote sensing of land surface properties, such as vegetation, soil moisture, and surface temperature, as inaccuracies in atmospheric correction can lead to errors in the estimation of these parameters. Therefore, the use of neutral polarization points can greatly improve the accuracy of land-atmosphere parameter separation in remote sensing.

5. Latest Developments in Land-Atmosphere Parameter Separation

Several advancements have been made in the field of land-atmosphere parameter separation, including the introduction of new algorithms and models. One such development is the use of machine learning techniques to estimate parameters such as soil moisture and vegetation density. These techniques are particularly useful in areas where ground measurements are sparse or difficult to obtain. Additionally, new remote sensing technologies, such as microwave and lidar, have been developed to improve parameter estimates. These advancements have resulted in more accurate and reliable estimates of land surface parameters, which are crucial for weather forecasting and climate modeling. However, there are still limitations to these techniques, such as their dependence on specific land surface and atmospheric conditions. Further research is needed to develop more robust parameter separation techniques.

6. Advantages and Limitations of Neutral Polarization Points

Neutral polarization points (NPPs) are a valuable tool for separating land-atmosphere parameters, but they come with both advantages and limitations. One of the key advantages of NPPs is that they enable a higher level of accuracy in parameter retrieval compared to traditional methods. This is because they provide a more precise measurement of the atmosphere’s polarization state. Another advantage is that NPPs can be identified in various types of images, such as those taken from airplanes or satellites. However, there are also limitations to the use of

https://journals.researchparks.org/index.php/IJOT e-ISSN: 2615-8140 | p-ISSN: 2615-7071
Volume: 5 Issue: 6 |Jun 2023

NPPs. For example, they are often difficult to identify accurately and quickly since they depend on several atmospheric and surface parameters. Additionally, the NPP is known to shift with changing atmospheric conditions, leading to potential errors in parameter retrieval. Therefore, while NPPs offer significant benefits for land-atmosphere parameter separation, their use requires careful consideration of these advantages and limitations.

7. Challenges in the Use of Land-Atmosphere Parameter Separation Techniques

The utilization of land-atmosphere parameter separation techniques poses numerous challenges that require further investigation and refinement. One major challenge is the inherent complexity of the land-atmosphere system, which makes it difficult to accurately separate and quantify each component. Additionally, the spatial and temporal variability of these components further adds to the challenge. Another challenge is the lack of adequate observational data, especially in remote regions, which limits the effectiveness and applicability of such techniques. The choice of appropriate models and algorithms for parameter separation is also critical, as it can significantly affect the accuracy and robustness of estimates. Finally, accounting for uncertainties and errors in parameter separation is essential, as the accuracy of the resulting estimates is directly related to the magnitude of these errors. Addressing these challenges requires a multidisciplinary approach, involving scientists from various fields, including meteorology, hydrology, ecology, and data science. Advances in technology, such as remote sensing and machine learning, can also provide valuable tools for improving land-atmosphere parameter separation techniques.

8. Conclusion: The Growing Importance of Neutral Polarization Points and Land-Atmosphere Parameter Separation in Remote Sensing

In conclusion, the emerging field of remote sensing is becoming increasingly important in our efforts to monitor and understand our environment. Neutral polarization points and land-atmosphere parameter separation techniques are crucial tools in this endeavor. These innovative approaches aimed at reducing the impact of atmospheric interference in remote sensing measurements offer clear and significant advantages over traditional methods. By providing more reliable and accurate data, they enable a better understanding of climate change, natural disasters, and many other environmental phenomena. As remote sensing technology continues to evolve, it is essential to continue research and development in this area to stay at the forefront of environmental monitoring and management.

Reference

1. Розиков, Ж. Ю., Собиров, М. М., & Рузибоев, В. У. (2021). Поляризационные характеристики диффузно отраженного и проходящего излучения в среде с конечной оптической толщиной. *«Узбекский физический журнал»*, *23*(2), 11-20.

2. Sobirov, M. M., Rozikov, J. Y., & Ruziboyev, V. U. Formation of neutral points in the polarization characteristics of secondary radiation in the semi-infinite medium model. *International Journal of Multidisciplinary Research and Analysis*, *4*, 406-412.

https://journals.researchparks.org/index.php/IJOT e-ISSN: 2615-8140 | p-ISSN: 2615-7071
Volume: 5 Issue: 6 |Jun 2023

3. Sobirov, M. M., & Rozikov, J. Y. (2020). SOME QUESTIONS OF THE THEORY OF POLARIZED RADIATION TRANSFER IN AN ISOTROPIC MEDIUM WITH A FINITE OPTICAL THICKNESS. *Scientific-technical journal*, *3*(4), 16-22.

4. Sobirov, M. M., & Rozikov, J. Y. (2020). SPECIFIC FEATURES IN POLARIZATION OF DIFFUSELY REFLECTED AND TRANSMITTED RADIATION IN A MEDIUM WITH FINITE OPTICAL THICKNESS. *Scientific-technical journal*, *24*(5), 85-89.

5. Собиров, М. М., & Розиков, Ж. Ю. (2020). Особенность в поляризации диффузно отраженного и пропущенного излучения в среде с конечной оптической толщиной. *Научнотехнический журнал*, 85-89.

6. Собиров, М. М., & Розиков, Ж. Ю. (2020). Некоторые вопросы теории переноса поляризованного излучения в изотропной среде с конечной оптической толщиной. *Научно-технический журнал*, 15-24.

7. Ivchenko, E. L., & Sobirov, M. M. (1986). Theory of two-phonon resonance light scattering involving an acoustic and an optical phonon. *Fizika Tverdogo Tela*, *28*(7), 2023-2031.

8. SOBIROV, M., & Yuldashev, N. K. (1984). THEORY OF TRANSFER OF POLARIZED RADIATION IN CUBIC-CRYSTALS LOCATED IN A LONGITUDINAL MAGNETIC-FIELD IN THE REGION OF EXCITON RESONANCE. *ZHURNAL EKSPERIMENTALNOI I TEORETICHESKOI FIZIKI*, *87*(2), 677-690.

9. Ахмедов, Б. Б. (2020). МЕТОД КР-ВОЗМУЩЕНИЙ С УЧЕТОМ ВЫРОЖДЕНИЯ. In *Наука и современное общество: актуальные вопросы, достижения и инновации* (pp. 21-25).

10. Akhmedov, B., Rozikov, J., Muminov, I., & Ruziboev, V. (2018). ABOUT WAVEFUNCTIONS IN LOW-DIMENSIONAL SEMICONDUCTORS. *Central Asian Problems of Modern Science and Education*, *3*(4), 51-57.

11. Полвонов, Б. З., Насиров, М., Мирзаев, В., & Разиков, Ж. (2019). Диагностика полупроводниковых материалов методом поляритонной люминесценции. In *General question of world science* (pp. 39-42).

12. Akhmedov, B. B., Rozikov, J. Y., & Muminov, I. A. MATERIAL'S ELECTRONIC STRUCTURE. *Zbiór artykułów naukowych recenzowanych*, *78*.

13. Rozikov, J., Akhmedov, B., Muminov, I., & Ruziboev, V. (2019). DIMENSIONALLY QUANTIZED SEMICONDUCTOR STRUCTURES. *Scientific Bulletin of Namangan State University*, *1*(6), 58-63.

14. РАСУЛОВ, В., РАЗИКОВ, Ж., КАРИМОВА, Г., АБДУБАНАНОВ, А., & ЭШБОЛТАЕВ, И. (2017). Расчет коэффициента прохождения электронов через многослойной

https://journals.researchparks.org/index.php/IJOT e-ISSN: 2615-8140 | p-ISSN: 2615-7071
Volume: 5 Issue: 6 |Jun 2023

полупроводниковой структуры, состоящей из прямоугольных потенциальных ям и барьеров. *Современные научные исследования и разработки*, (2), 183-185.

15. Собиров, М. М. (2021). ИЗМЕРЕНИЕ ПОЛЯРИЗАЦИЯ СВЕТА В ЧИСТОЙ АТМОСФЕРЕ. *EDITOR COORDINATOR*, 308.

16. Расулов, Р. Я., Мамадалиева, Н., Ахмедов, Б., & Разиков, Ж. К теории зонной структуры халькогенидов свинца. *Ilmiy xabarnoma*, *6*(1), 18.

17. Собиров, М., Розиков, Ж., Рузибоев, В., & Ходиев, И. (2021). ПОЛЯРИЗАЦИЯ СВЕТА В ЧИСТОЙ АТМОСФЕРЕ НА БОЛЬШОЙ ВЫСОТЕ. *InterConf*, 249-253.

18. Sobirov, M. M., & Rozikov, J. Y. (2020). SPECIFIC FEATURES IN POLARIZATION OF DIFFUSELY REFLECTED AND TRANSMITTED RADIATION IN A MEDIUM WITH FINITE OPTICAL THICKNESS. *Scientific-technical journal*, *24*(5), 85-89.

19. Sobirov, M. M., & Rozikov, J. Y. (2020). SOME QUESTIONS OF THE THEORY OF POLARIZED RADIATION TRANSFER IN AN ISOTROPIC MEDIUM WITH A FINITE OPTICAL THICKNESS. *Scientific-technical journal*, *3*(4), 16-22.

20. Маматова, М. А., & Мансурова, Г. А. (2020). МЕТОД КР-ВОЗМУЩЕНИЙ. In *ИННОВАЦИОННЫЕ НАУЧНЫЕ ИССЛЕДОВАНИЯ: ТЕОРИЯ, МЕТОДОЛОГИЯ, ПРАКТИКА* (pp. 14-18).

21. Bakhodir, A. Rozikov Jurabek Lecturer, Fergana State University Muminov Islomjon, Lecturer, Fergana State University Ruziboev Valijon. ACTUAL PROBLEMS OF MATHEMATICS, PHYSICS AND MECANICS……... 7
MATYOKUBOV H. SH., BABAJANOV DB SOLITON MECHANISM OF CHARGE TRANSPORT IN BRANCHED CONDUCTING POLYMERS AND VERIFICATION OF CONSERVATION LAWS……...