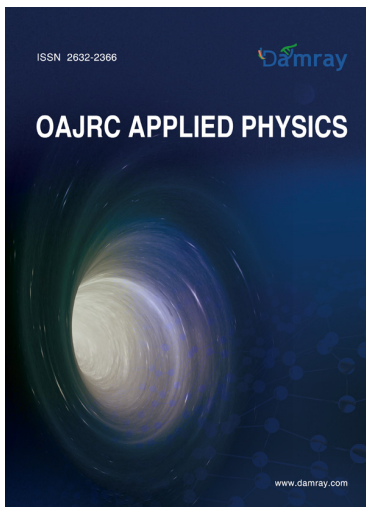


Research on the Development of Geophysics

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Abstract

Whether it is the understanding of geophysical characteristics or the basic requirements for the development of the national economy, geophysics is very important. According to the existing research results, the development of solid geophysics in my country, the development trend of major sciences and observation methods are reviewed. Through the extensive use of geophysics, its status and functions in various scientific centers are analyzed, its model is initially explored, and it is applied to the national economy and the formulation of national policies.

Keywords

Geophysics, solid geophysics, development trend, development momentum

<https://oajrcap.damray.com/>

OPEN ACCESS

DOI: 10.26855/oajrcap.2022.12.002

Received: October 18, 2022

Accepted: November 17, 2022

Published: December 12, 2022

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Introduction

The development of earth science is limited by national economic strength and scientific and technological means, and it has become a science with global influence. Therefore, we must start from the long-term development needs of the world, strengthen the development and popularization of applied geophysics and its science and technology, solve economic and social development, key technical problems, and promote the development of productivity[1].

1. Frontiers of Geophysics

Geophysics is an important means to understand the internal structure of the earth, which requires organic

quantification of its boundary conditions, properties of internal media, and internal coupling and interaction. The development of geophysics includes: geodesy, three-dimensional image of the earth's interior, and interlayer coupling of the earth's interior. In every respect, new means of observation can be derived from the above with more precise constraints, such as the relative and absolute motion of the Earth's surface, faults, and plates. Second, with the continuous deepening of the earth's lithosphere and the rapid development of computer technology, these have provided a strong support for the three-dimensional images of the earth's interior. Third, the technology and theory research on the mantle - core interaction has made progress, which is closely related to the mantle - core interaction and the interaction between the earth's cores[2].

2. The development of geophysics and its inevitability

As an important basic theory in the 21st century, geophysics has been the focus of attention for a long time. The upper mantle engineering in the 1960s , the geodynamic engineering in the 1970s , and the continental lithosphere engineering in the 1980s are all major turning points in the development of geophysics. These programs have shifted the focus of research from the surface to the center of the Earth, making geophysics the only place where the structure and characteristics of the Earth's interior can be directly understood[3]. Geophysics is a kind of research that can absorb high technology and can observe and study seismic waves, gravity, magnetic field, electromagnetic, heat and other physical aspects. This is characteristic of the most advanced high-tech fields in the world and a symbol of geophysical prosperity.

According to the development trend of the past 20 years, the comprehensive application of observation, information science, computer and other high-tech will surely promote the rapid development of geophysics. The United States and Germany built a digital seismic network in 1975, and 440 stations have been built so far[4]. In addition, earth observation technology, earth motion observation network, and global high-precision gravity observation technology are also developing continuously. The emergence and rapid development of the global Earth observation system is a new stage of geophysics from quality to quantity. Using computer technology to analyze the time and space of the earth has become a hot research topic in the world today. The Institute of Geology is committed to the study of seismic waves, gravity, magnetic field, and electric field of complex geological bodies, so as to describe geological units in detail and convert them into topographic maps for better comprehensive research[5]. The reality of scientific development clearly shows that geophysics in the 21st century must be the pioneer of earth science, injecting the vitality of other disciplines into the development of geophysics, so that it can develop together with it.

3. Discussion on the development dynamics of solid geophysics

The law of physics is that in dynamical systems, slow elements cause rapid changes . The reason why we study the earth is because it is a world without physical phenomena, laws, and human will; secondly, the development of earth science depends on human beings[6]. The research and development of geophysics is possible in the final analysis, because the things it involves are all objective and can directly or indirectly affect our lives.

4. Layer structure and interlayer coupling in the Earth's interior

On this basis, combine theory, observation and experiment in order to achieve a breakthrough in theory, observation and experiment. To achieve this goal, we must take the whole earth as a whole to discuss the structure, material composition, The coupling of medium and material composition, core - mantle surge, and the interaction between mantle convection and force source. In this environment, it is difficult to get answers based on the knowledge of geophysics, so geologists must learn from nearby The relevant areas of the city absorb "nutrients" and look for new growth points through crossover, penetration, and integration to wait for a new "birth".

High-level comprehensive research is for breakthroughs and sublimation , using artificial lake earthquakes, natural earthquakes, gravity fields, magnetic fields, electric fields, geothermal, radioactive, physical and mathematical simulations, as well as the formation and physical properties of rocks and minerals under high temperature and high pressure[7]. Comprehensive research, combined with comprehensive research on earth structure, geochemistry, dynamic geodesy, space exploration, etc., to determine the structure, origin, evolution and dynamic model of the earth's interior, to determine oil and gas, gas, metal mineral resources, earthquakes and environment The pollution dynamic simulation system proposes a conceptual model for comprehensive evaluation and prediction .

5. The Situation Facing Mineral Resources and the Intensified Contradiction Between Supply and Demand

With the development of science and technology, human beings have higher and higher requirements for science and technology, which also raises many problems for the development of today's world. Energy crisis, population crisis, food crisis, environmental crisis, energy crisis, population crisis, food crisis, environmental crisis. In the 20th century, the global oil production reached 119 billion tons and 65 trillion cubic meters of natural gas. Among them, copper has been mined for more than 10,000 years. Before the 20th century, only 35 million tons were mined. 155 million tons. The annual production is expected to reach 100 billion tons to 1.2 billion tons in the early part of this century[8]. The demand for mineral resources such as coal, silver, rare metals, and non-metals is increasing day by day, and the shortage of fresh water resources has become an important factor restricting human survival and development.

In a country with a vast territory and few products, the demand for resources is very serious. In the past 10 years, our production has experienced a moderate increase, from 137 million tons to 162 million tons, with an average annual growth rate of 1.38%. At the same time, consumption also increased from 118 million tons to 223 million tons, an annual growth rate of 7.1%. Since it became a net importer in 1993, since 2000, the import volume and daily consumption have continued to increase, reaching 70 million tons by 2000. Therefore, around 2010, crude oil imports are expected to increase significantly, and its dependence on crude oil will increase from 30% in 2000 to 60% in 2010 and 80% in 2030. Although the economy is developing rapidly and its demand for crude oil and metals is also increasing, the problem of energy structure is becoming more and more prominent[9]. This is because of growing demand for energy, increasing dependence on imports and increasing concentration. At the same time, we should also be aware that the future increase in demand for energy and mineral resources will inevitably lead to a decline in the number of easily found minerals, especially in shallow sea areas, and the earth will face serious shortages, which will lead to social unrest and international conflicts and confrontation.

In order to meet the future economic development, the development and deepening of geophysics must solve major social issues closely related to human interests, such as: reduce natural and man-made disasters, ensure and protect sufficient clean water sources, prevent pollution, properly store and destroy Toxic, radioactive waste, long-term rational use of natural resources, comprehensive environment, urban construction, environmental protection, energy efficiency improvement, and solving major social issues closely related to human interests such as new energy. Especially at present, it is necessary to increase the exploration of deep layers, oil and natural gas, expand resources, and open up new fields. Research in this field will have a lot of room for development. To this end, geophysicists work closely with geologists, geochemists, naturalists, sociologists, politicians and people in various fields, and jointly formulate relevant policies and regulations with relevant international agencies to improve The quality of living space and the environment, and the development of natural resource management should explore new scientific approaches.

6. The global environment continues to deteriorate

Today, environmental issues are no longer limited to regions and countries, but have multiple mechanisms. For example, we have learned that at the surface, gaseous and liquid substances produced by nuclei produce some organic substances, such as oil and natural gas, but are there organic substances in deeper places? Although the scale of inorganic hydrocarbons is so far small, the strong link between earthquakes and uplift of highlands and the activity of deep material shows the importance of people recognizing, understanding, using and protecting a "green" planet. At the same time, it is also an important field that must address and promote the development of human society. With the advancement of science and technology and extensive penetration, the "endless" development of industry, agricultural production, population, transportation, etc., but the construction of environmental protection facilities is very little, the investment is very little, laws and regulations are not perfect, the level of scientific research is low, eager for quick success, "Green" social and environmental problems are becoming more and more serious.

Conclusion

Geophysics has played an important role in the rapid industrialization and rapid economic development. This is not only a major opportunity for geophysics, but also a major challenge. The development of these two pathways is obviously fundamental, pertinent, and practical, so we should fully understand its theoretical implications, because understanding natural processes can enhance our language ability. To do this, we must be in scientific discovery Under the guidance of sublimation and new theory, fully consider its generated or potential economic and social benefits, and actively deal with social development and various challenges in the future.

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