

# Application of Remote Sensing Technology in Geological Surveying and Mapping

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**Abstract:** Remote sensing technology is widely used in various industries in China, and plays its own role. In geological surveying and mapping, its remote sensing technology can optimize the process of geological surveying and mapping, change the traditional working methods, and make its geological surveying and mapping results more accurate. Therefore, it is necessary to understand the applications of remote sensing technology in geological mapping. In this paper, we need to understand the content of remote sensing technology first, and then explain the specific application of remote sensing technology in geological surveying and mapping, explain the development prospect of remote sensing technology, and provide reference for the corresponding researchers.

**Keywords:** Geological Mapping; Remote Sensing Technology; Application

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At present, with the continuous improvement of China's science and technology level, there are more opportunities for geological surveying and mapping. As an important part of the current advanced technology, remote sensing technology has also been effectively applied to geological surveying and mapping, which can not only change the problems existing in the traditional measurement methods, but also better ensure the accuracy of the results, thus providing effective help for the corresponding work. Therefore, the application of remote sensing technology in geological mapping should be deeply studied, which is of great help to the development of geological mapping.

## 1. Remote sensing technology content

In the 1960s, based on electromagnetic waves, and

then using the corresponding equipment, the information was effectively collected and sorted out according to its contents, and then remote sensing technology was developed. This technology can detect the object it wants to detect, and it has many corresponding technical contents, and it can only be effectively realized in its remote sensing, transmission and processing equipment. When testing on the ground, much equipment is needed. At present, according to the different objects to be measured, the types of sensors are different, which can effectively monitor a variety of electromagnetic waves. In the process of applying its remote sensing technology to geological mapping, it has many advantages. For example, the detection range is large, and the accuracy of obtaining information is high, which will not be affected by the external environment in the process of surveying and mapping.

## **2. The significance of remote sensing technology application in geological surveying and mapping**

### **2.1 It can ensure the accuracy of data**

In the process of geological surveying and mapping, if the traditional method is used, then the theodolite, level and other tools are used for surveying and mapping, which will lead to many factors in the process of surveying and mapping, so it is easy to have problems. The geological surveying and mapping itself has high requirements for the results, so it is difficult to carry out the corresponding geological survey work smoothly. By applying its remote sensing technology, the problem of inaccurate data, update the database effectively and ensure the accuracy and real-time information can be solved.

### **2.2 It can achieve the purpose of real-time monitoring**

In the application process of remote sensing technology, its database will be updated in real time, so that its geological changes can be monitored in real time, and the geological conditions can be well understood, and then its surveying and mapping data can be effectively improved, thus providing the corresponding basis for geological survey work, realizing the effective investigation of land utilization rate, laying a good foundation for the smooth development of corresponding work and promoting the stable development of our society.

### **2.3 The work will be completed more comprehensively**

In the process of geological surveying and mapping, some special areas are often encountered, but if traditional surveying and mapping methods, such as theodolite, are used in these areas, accurate results can not be obtained, and even if the surveying and mapping is finally completed, there will be problems in its geological mapping. Therefore, by applying remote sensing technology to it, the surveying and mapping work in complex areas can also be solved, and the accuracy of its working data can be ensured. Some hidden information can also be well detected, ensuring the accuracy of the final result.

### **2.4 It will not be disturbed**

For geological surveying and mapping itself, it is very easy to be affected by external factors, such as climate, geology and so on, and at the same time it is also affected by local factors. Therefore, in order to better ensure the accuracy of its surveying and mapping work, the remote sensing technology should be used, which can improve the accuracy of geological surveying and mapping and ensure that it will not be affected by external factors. By effectively collecting electromagnetic waves, the accuracy of the final results can be better ensured and better help for the application of corresponding work will be provided.

## **3. The application of remote sensing technology in geological surveying and mapping**

In the process of geological surveying and mapping, surveying and mapping work is mainly carried out according to the corresponding geology, providing help for the accuracy of its map. If traditional geological surveying and mapping is used, manual surveying and mapping methods are adopted, which leads to inaccurate final results and can not effectively reflect the current geological conditions. At present, due to the continuous improvement of science and technology, China's geological surveying and mapping also has a good development. Applying its remote sensing technology to geological mapping can better improve the quality of work.

### **3.1 Biogeochemical technology**

With the continuous improvement of remote sensing technology, a biogeochemical technology has emerged. The effective combination of this technology and its remote sensing technology can provide corresponding help for its geological mapping. If this technology is effectively applied to surveying and mapping, we can know the corresponding ore results covered by vegetation. Therefore, this technology is often used in ore prospecting, which can better ensure the accuracy of the final results, and has a larger exploration angle and better results. Through the effective application of remote sensing technology, it is possible to better search for ore within the specified range, and also to measure places far away. For example, the actual content can be understood by detecting the vegetation coverage area, and this technology mainly studies the specific content of its vegetation

index and the actual situation of vegetation.

### **3.2 Extraction of the corresponding data information of geological structure**

With different geological tectonic movements, the corresponding mineral resources that can be obtained are also different. Because of the movement of different geological scales, the distribution of minerals will be very different. For the corresponding information of mineral structure, its surrounding environment and the effective extraction of its address structure data can be effectively analyzed by using linear and circular influences. Because the image of remote sensing technology is not clear in the imaging process, it will affect the following work. By enhancing the edge, ratio analysis and other technologies, the geological structure data can be better defined, its linear or circular content can also be specifically understood, and geochemical exploration, geophysical exploration and so on will be combined to better define the mineral structure.

### **3.3 Application in thematic map making**

As far as spatial resolution is concerned, it is easily affected by external factors, such as width, wavelength and so on. Therefore, in order to better ensure the accuracy of its thematic map, it is necessary to actively carry out surveying and mapping work to better ensure that the content of its thematic map meets the corresponding requirements. In the process of carrying out the work, it needs to be able to define the surveying and mapping targets first, especially for the smaller content, which needs to be understood. By applying remote sensing technology to thematic maps, the work quality can be better ensured, and the correct spatial resolution can be selected by analyzing the actual situation. If the bands cannot be determined effectively, it is necessary to measure each band and ensure the accuracy of each wavelength, which needs to be applied to remote sensing technology. By using remote sensing technology, the specific content of spatial resolution can be better defined and utilized, and the quality of thematic map can be effectively improved.

### **3.4 Dynamic monitoring technology**

With the continuous improvement of science and technology level in China, remote sensing technology is constantly innovating. By adding dynamic monitoring to

geological surveying and mapping, the corresponding mapping information can be got more accurately, and by effectively combining GPS and remote sensing, the geological surveying and mapping work will be more convenient. In the process of applying remote sensing technology to carry out corresponding geological mapping, its dynamic monitoring technology is more convenient. This content is that in the process of geological mapping, through the application of remote sensing technology, the dynamic situation of the monitored object can be known and the accuracy of the detected data can be ensured. In the process of geological surveying and mapping, dynamic monitoring is to transform abstract information into identifiable information through the application of corresponding data information and computer technology. In this process, the staff can obtain more accurate data, clearly define the content of geological mapping, and then understand the land change situation in all aspects, and compare it with the data of each time period, so as to obtain accurate data information. Moreover, with the continuous improvement of information technology, the processing ability of computer is also improving. In the subsequent development, dynamic monitoring technology can better play its own role, and then provide corresponding help for its geological mapping work.

### **3.5 Remote sensing image digital mapping system**

This system has the characteristics of intelligence, using remote sensing technology to obtain images, and then understand the actual geological situation. Compared with the previous methods, this system can ensure the authenticity and accuracy of its images, not only improve the accuracy of geological mapping and the amount of resources and information of geological mapping work, but also provide corresponding help for the smooth development of geological mapping work. The mapping system of remote sensing image data information can make three-dimensional geological results. At the same time, it also realizes the automation of image mosaic. On this basis, the drawn results are more accurate and the images are clearer, which can make users have a good understanding of geological conditions, better ensure the accuracy of data and ensure the real-time information.

## **4. Shortcomings and prospects of**

## remote sensing technology

### 4.1 Deficiency

Because the contents of geological mapping and remote sensing technology are different, it is necessary to further study them when combining work. At present, the common phenomenon is that geological surveying and mapping workers do not understand remote sensing technology, and they do not know the role of remote sensing technology in geological surveying and mapping, and what specific applications it has. Influenced by their own technical level, geological surveying and mapping workers can only cooperate with professional remote sensing workers in the process of applying their remote sensing technology. At the same time, remote sensing technicians themselves lack the corresponding knowledge of geological mapping, and can not find out the key contents in the process of processing and analyzing their images, which leads to great problems in the application of remote sensing technology.

### 4.2 Prospects

With the continuous improvement of information technology, the application of remote sensing technology in geological mapping will be more and more extensive. In the future development, the level of remote sensing technology will be higher, because it is affected by the improvement of computer technology, and remote sensing technology is based on these technologies. Therefore, in the process of improving computer technology level, the accuracy and speed of remote sensing technology will be greatly improved, which can better meet the

needs of geological surveying and mapping. Secondly, integration will be better. Because the remote sensing technology should be combined with other technologies in the future development, it makes the technical content richer, involves more specialties and is more practical. For example, the current active remote sensing and passive remote sensing are constantly merging, and now they have been able to form a mode of active and passive co-operation, which is believed to be more closely related in the future development.

## 5. Conclusion

To sum up, in the current social development, the role of surveying and mapping is more important, which can not only provide corresponding services for society and life, but also promote the effective development of China's economy. Therefore, it is important to ensure the accuracy of its surveying and mapping, apply its remote sensing technology, collect relevant information through the use of corresponding technology, and then process its information, so as to form an intuitive image, help the corresponding work and ensure the effective work.

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