Study on Gold Mineralization Prediction Method Based on Dual Frequency IP Method and Wide Area Electromagnetic Method

XIAOQIN LI¹, HONGFU LIU¹,*, NIE XIN²
¹ College of Mining Technology, Taiyuan University of Technology, Taiyuan 030024, P. R. China
² China Coal Geology Engineering Corporation, China

ABSTRACT: China's gold production and existing gold reserves can't meet the growing demand for economic development. Traditional mining of shallow gold deposits has reduced the existing gold resources. Exploration and exploitation of deep gold deposits must be made. In order to carry out the research of the hidden deep ore better, a new geophysical exploration method must be adopted. Dual frequency IP method and wide area electromagnetic method were used to detect gold deposits in Jiaodong area, and the validity of the method was verified. Through the field survey and data collection, the corresponding maps of the IP scanning, IP sounding and wide area sounding were drawn, and low resistivity anomaly area and prospecting target area were found. This fully demonstrated the effectiveness of the comprehensive physical exploration method in gold ore prospecting, and had a certain role in promoting the exploration of deep gold deposits in china.

INTRODUCTION

After decades of reform and opening up, China's economy has entered a period of rapid development. Nowadays, China's economic status has been gradually improved in the world. With the rapid development of economy, the demand for all kinds of mineral resources is also very large. Mineral resources affect the speed and pattern of national economic development to a certain extent [1]. As one of the most important precious metal resources in mineral resources, gold ore is not only an essential production resource in many productions, but also a strategic reserve resource in China [2]. After the founding of the People's Republic of China, the exploration and exploitation of gold deposits have been made in china. However, with the increasing exploitation of mineral resources, the amount of mineral resources has been less and less after a large amount of exploration and exploitation of mineral resources. It is more and more difficult to explore the surface mineral resources.

Therefore, it is necessary to increase the depth of exploration, and obtain mineral resources from the deep, especially gold resources [3]. However, there are some limitations in traditional methods and techniques, and the exploration depth is in the range of several hundred meters generally [4]. China's deep mineral resources are very rich. In order to carry out exploration and exploitation, it is necessary to update the scientific and technological means and exploration ideas. The combination of dual frequency IP method and wide area magnetoelectric method has improved the depth and accuracy of ore prospecting greatly [5].

In order to study the application of dual frequency IP method and wide area magnetic method in gold ore prospecting, the practical application of the method can be used to understand the characteristics and methods of the comprehensive prospecting method so as to solve the difficulty of finding the gold mine in our country effectively. The application of gold deposit in Jiaodong area is selected as a practical application case because the area is larger with a lot of deep burial. It can be seen from the results of the exploration that the mine has good exploration value. The formation characteristics and ore controlling structure can be obtained by comprehensive geophysical prospecting method. This method can also be used to determine the distribution of
magmatic rocks and obtain the physical parameters and geophysical characteristics of rock and ore in mining area. It can also design a reasonable network layout. The dual frequency IP method and wide area magnetic method can be used to detect the anomaly information and the positioning of the deep concealed ore deposits in the exploration area 900m-2000m, thus reducing the difficulty and risk of finding gold deposits. And a reasonable optimization of the exploration program can be developed to enhance the accuracy of exploration, namely drilling efficiency. It is proved that the integrated geophysical prospecting method is effective in the actual gold ore prospecting. It is of great significance to promote the exploration of deep gold deposits and the promotion of the production of gold resources in China. It can further promote the steady development of China's economy.

2. Gold deposits and prediction methods in China

2.1 Research on the current situation of gold deposits in China

China's vast territory and abundant resources and mineral resources are also very rich. The common gold resources include gold, gold and associated gold. At present, the most important development object is rock gold [6]. A country's gold reserves reflect the economic strength of the country, as well as the ability to respond to international economic risks to a certain extent. China has always attached great importance to the exploitation and storage of gold deposits. Although China is one of the earliest countries in the world to exploit gold ore, there is no systematic exploration and exploitation of gold deposits for a long time. After the founding of new China, China's exploration and exploitation of gold has finally entered a new stage [7]. As a national strategic material, the gold mine reflects the degree of credit in the international economic trade, and it can play a role in curbing inflation and stabilizing the national economy [8]. After entering the twenty-first Century, economic globalization make the global economy more vulnerable to the risk of stimulation to a certain extent. China has increased its gold reserves, from exploration and exploitation of gold deposits mainly [9]. China's gold reserves is 1808.4 tons and is located in the fifth in the world's gold reserves, accounting for the global total gold reserves of 5.5%. Although China's gold reserves have been greatly improved, but compared with the needs of China's economic development, it is far from enough. On the other hand, the amount of gold needed for production demand is as high as more than 1 thousand tons per year. China's current annual output is only more than 400 tons of gold. China's annual output of gold is 175 tons in 2000 and reaches 341 tons in 2010, and reaches 428 tons in 2013 and is 450 tons in 2015. But first time the phenomenon of negative growth occurs [10].

![Table 1: 2015 gold reserves and the proportion of the world's major countries](image)

<table>
<thead>
<tr>
<th>Country</th>
<th>Storage capacity (T)</th>
<th>Proportion</th>
</tr>
</thead>
<tbody>
<tr>
<td>U.S.A</td>
<td>8133.5</td>
<td>24.8%</td>
</tr>
<tr>
<td>Germany</td>
<td>3381</td>
<td>10.3%</td>
</tr>
<tr>
<td>Italy</td>
<td>2451.8</td>
<td>7.5%</td>
</tr>
<tr>
<td>France</td>
<td>2435.6</td>
<td>7.4%</td>
</tr>
<tr>
<td>China</td>
<td>1808.4</td>
<td>5.5%</td>
</tr>
<tr>
<td>Russia</td>
<td>1447</td>
<td>4.4%</td>
</tr>
<tr>
<td>Switzerland</td>
<td>1040</td>
<td>3.2%</td>
</tr>
</tbody>
</table>

At present, China has proven gold resources reaches 1254 tons. Among them, the most famous is the Jiaodong Shandong gold mine, and the main mining area is Linglong gold mine [11]. In addition, the Qianxi Hebei gold mine is one of the three gold mines in China. The mineralization is granite in late Yanshan period mainly. The second types of gold deposits in China are sedimentary rocks. Although this kind of ore grade is relatively low, try to disperse and small, the scale is very large. It is mainly distributed in China's Shaanxi Sichuan area, and it also has a great discovery in Chuan Si Song Pam and Nanping [12]. In addition, there are many gold deposits formed by volcanic rocks, and it is distributed in the andesite of the third stage sandy rock mainly. The mode of existence is the filling type. China discovers the single rare gold veins in the Hadamengou mining area of Inner Mongolia. The geological structure is complex, which is one of the super large gold deposits in china. Proven reserves of gold resources in the region can reach up to 127t and the potential economic value is about 27 billion yuan. Now known as the largest gold mine in China, Shanghang Zijinshan Copper Gold, gold resources proved part are about 305t. It is the largest mining area and the largest gold mining area [13].
2.2 Prediction methods of gold deposits

China's first survey of gold exploration occurred in the nineteenth Century that a group of foreigners scattered to China. After the founding of new China, a relatively systematic and concentrated investigation of gold is carried out. In order to better carry out the exploration of gold deposits in China and promote the development of China’s economy, the Chinese people's Armed Police Force is set [14]. China in the armed forces of gold explored domestic gold resources of more than 1 thousand and 800 tons, covering 25 provinces Chinese in the past 30 years. In the exploration process, they found a number of typical gold deposits, such as Heilongjiang United ditch, Henan Dong Chuang, Yunnan, into the factory, etc. China has published a number of books with high academic value, such as gold and silver exploration Handbook, chemical analysis of gold, Chinese gold ore records, etc. This has a positive role in the exploration of gold mine and the exploration of mineral resources in the world. China's gold army represents the highest standards and the most advanced technology of China's mining technology, and has also contributed to the upgrading of China's mining equipment [15]. China's scientific research workers have always been the only criteria for prospecting for gold in the past decades. But the first discovery of granite porphyry can be found in China in 1999. In addition, the geological team of China has made great achievements in the exploration of gold deposits, such as the development of the altered rock type gold deposit. This makes our country find a large number of gold rich mineral resources, and the amount of gold found is 40 times of the previous [16].

The traditional gold exploration is based on geochemical exploration. Exploration geochemistry is an important method to find rare precious metal minerals. This relatively intuitive method of ore prospecting is not only to think about geology, but also the comprehensive utilization of chemical elements and other geochemical parameters [17]. Compared with other methods, the method of geochemical exploration has a direct reflection of the distribution of mineral elements and elements, which can locate the deep concealed ore deposits accurately. At present, the commonly used geochemical exploration methods include the method of ground gas, groundwater geochemistry, thermoluminescence mercury, organic hydrocarbon and so on [18]. Among them, the commonly used method is tectonic geochemistry. In the study of the layered structure, the distribution and migration, enrichment and dispersion of the elements can be studied directly. It is an organic combination of the chemical and tectonic action of the earth. This method has very prominent advantages compared with the traditional method of primary halo, which can capture with the prospecting significance of some weak anomalies on the spatial range and paid more attention to the geological structure of halo formation control on hydrothermal mineralization [19]. But the method also has some shortcomings. Sometimes the interpretation of the spatial structure will be contradictory and far-fetched slightly. The prospecting mark is not real enough in the process of ore prospecting, which leads to the failure of searching.

A case study of gold deposits in Jiaodong area is carried out. Many scholars believe that the formation of gold deposits in this region is due to the severe left lateral strike slip of the Pacific plate during the subduction of the Pacific plate, which results in a large number of intermediate acid magmas. Under the joint action of structure and magma, it was formed in Yanshan period finally. The main role of granite is not to provide minerals directly, but plays a role in the heat engine in the process of mineralization. The relationship between the gold deposit and the intermediate basic dikes are characterized simultaneous, homologous and isomorphism. Therefore, the middle basic vein rock is sometimes used as a symbol for ore prospecting in the process of ore searching [20]. The age of the basic dikes in the fault zone is about 130M-110Ma in the Jiaodong area. And the peak of the gold mineralization is about 120Ma. The age of the intermediate basic dikes includes the age of gold mineralization. From the side, it is proved that the relationship between the basic vein rock and gold deposit. It can be seen from the previous studies that the geophysical characteristics of rock and ore in Jiaodong area, which is shown in Table 2.
Table 2: General geophysical characteristics of gold deposits

<table>
<thead>
<tr>
<th>Ore name</th>
<th>Number of blocks</th>
<th>$\rho_a (\Omega \cdot m)$</th>
<th>$\rho_a^\text{max}$</th>
<th>$\rho_a^\text{min}$</th>
<th>$\bar{\rho}_a$</th>
<th>$\eta_a^\text{max}$</th>
<th>$\eta_a^\text{min}$</th>
<th>$\bar{\eta}_a$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yellow ore</td>
<td>2</td>
<td>21.69</td>
<td>14.68</td>
<td>18</td>
<td>27.3</td>
<td>17.2</td>
<td>22.3</td>
<td></td>
</tr>
<tr>
<td>Huang Tiejuan stone</td>
<td>2</td>
<td>1424.9</td>
<td>718.09</td>
<td>1072</td>
<td>13</td>
<td>11.7</td>
<td>12.4</td>
<td></td>
</tr>
<tr>
<td>Lamprophyre</td>
<td>3</td>
<td>10821.3</td>
<td>1993.04</td>
<td>5625</td>
<td>1.6</td>
<td>1.3</td>
<td>1.4</td>
<td></td>
</tr>
<tr>
<td>Potassium granite</td>
<td>4</td>
<td>2719.36</td>
<td>1482.74</td>
<td>2014</td>
<td>2.6</td>
<td>1.7</td>
<td>2.2</td>
<td></td>
</tr>
<tr>
<td>Beresitization diorite</td>
<td>4</td>
<td>750.84</td>
<td>290.06</td>
<td>508</td>
<td>2.4</td>
<td>1.4</td>
<td>2.1</td>
<td></td>
</tr>
<tr>
<td>Bin Yan</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fresh granite</td>
<td>2</td>
<td>8600.2</td>
<td>4825.82</td>
<td>6713</td>
<td>2.2</td>
<td>0.9</td>
<td>1.6</td>
<td></td>
</tr>
<tr>
<td>Metamorphic rock</td>
<td>7</td>
<td>2893.49</td>
<td>712.7</td>
<td>1493</td>
<td>2.1</td>
<td>1</td>
<td>1.6</td>
<td></td>
</tr>
</tbody>
</table>

3. Application of dual frequency induced polarization method and wide area electromagnetic method in gold deposit prediction

3.1 Regional geological and physical characteristics

In order to study the application of dual frequency IP method and wide area electromagnetic method in gold ore prospecting, the gold mine in Jiaodong area was selected as the object of study to realize the exploration of deep gold deposits and to verify the validity of the integrated geophysical prospecting method. The structure of Jiaodong urban fault zone is NNE-NE, and the frequency of NNE tectonic belt is frequent accompanied by left lateral translation. It is also an important reason for the formation of gold deposits. The magmatic activity is frequent in the area, which has complicated rock types. The most widely distributed is Linglong granite. It is the most important ore bearing rock, which affects the production and distribution of gold deposits. The middle basic vein rock is very developed, and the alteration mineralization is serious in Jiaodong area. The study area is located in the middle part of the Zhaoping fault zone. The surface of the mining area is exposed to Jiaodong metamorphic rock and Linglong granite, and is distributed in various types of dikes and other quaternary sediments widely. The geology of the mining area is shown in figure 2:

Fig. 2 Geological sketch map of mining area

It can be seen from the geological map that Mining area is exposed in the Cenozoic Quaternary mainly, and the lithology is amphibolite, plagioclase and the main mineral is composed of quartz and plagioclase mainly. The rock table consists of sandy soil and humus soil. It is located in the valleys and hills. The interior of the mining area has a well-developed fault structure, and the fault zone runs through the whole mining area. The fault zone is inclined to the southeast. The main gold deposits are in the footwall of the main fracture plane, and the upper wall is the NEE trending fault mainly. The mining area is composed of magmatite and Linglong granite dikes mainly, located in the footwall of Zhaoping. Mineral compositions are plagioclase, K-feldspar, biotite, etc. which is in granite mainly. By measuring the resistivity parameters of the tunnel and the geological samples, the corresponding rock and mineral samples were collected, and the relevant physical parameters were obtained. Specific results are shown in table 3:

![Geological sketch map of mining area](image)
Table 3 Geophysical characteristics of some of the ore samples

<table>
<thead>
<tr>
<th>Ore name</th>
<th>Number of blocks</th>
<th>$\rho_a$ (Ω·m)</th>
<th>$\rho_a^{\min}$</th>
<th>$\rho_a^{\max}$</th>
<th>$\eta_a$ (%)</th>
<th>$\eta_a^{\min}$</th>
<th>$\eta_a^{\max}$</th>
<th>$\eta_a$ (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strongly potassium granite</td>
<td>13</td>
<td>17247</td>
<td>790</td>
<td>6185</td>
<td>0.85</td>
<td>0.49</td>
<td>0.66</td>
<td></td>
</tr>
<tr>
<td>Fractured granite</td>
<td>8</td>
<td>8571</td>
<td>2452</td>
<td>4187</td>
<td>0.67</td>
<td>0.23</td>
<td>0.44</td>
<td></td>
</tr>
<tr>
<td>Beresitization granite</td>
<td>13</td>
<td>5408</td>
<td>1180</td>
<td>3050</td>
<td>1.62</td>
<td>0.18</td>
<td>1.03</td>
<td></td>
</tr>
<tr>
<td>Beresite</td>
<td>6</td>
<td>4849</td>
<td>58</td>
<td>1751</td>
<td>4.05</td>
<td>0.18</td>
<td>2.39</td>
<td></td>
</tr>
<tr>
<td>Fresh granite</td>
<td>3</td>
<td>4914</td>
<td>2330</td>
<td>3504</td>
<td>0.62</td>
<td>0.4</td>
<td>0.48</td>
<td></td>
</tr>
<tr>
<td>Lamprophyre</td>
<td>1</td>
<td>909</td>
<td>909</td>
<td>909</td>
<td>0.38</td>
<td>0.38</td>
<td>0.38</td>
<td></td>
</tr>
</tbody>
</table>

It can be seen from table 3 that granite presents a high resistance trend in the mining area, and the silicified cataclastic granite, Huang Tiejuan rock and other related to the gold mine show a low resistance trend. This is a relatively small resistivity of the rock block without considering the impact of the fault zone and the impact of the mud flush, so it is difficult to reflect the actual situation of the field. However, it can be seen from the rock resistivity that the resistivity of ore bearing rock is not low resistivity. Therefore, it is necessary to combine with other results in the subsequent exploration. Some exploration work has been carried out in this area before the exploration study. Based on the previous exploration data, the double frequency induced polarization method and wide area electromagnetic method was adopted to explore the deep part of the mining area. The target area and target of later exploration were selected.

3.2 Forecasting methods

According to the prediction of the integrated geophysical characteristics of the mining area, the layout of the geophysical exploration work is determined combined with the previous geological data and other exploration results. There is a set of I - V measurement area, which includes the electric power and the wide area electromagnetic measurement points. The specific layout is shown in figure 3:

The dual frequency IP method is a superposition of two kinds of frequency current, and the transmitter is sent to the underground to synthesize the rectangular current wave. The receiver uses a dual channel to receive the frequency sine wave from the corresponding signal in the earth conduction, and finally forms the apparent amplitude frequency and the measured phase difference. This instrument SQ-3C dual frequency instrument is used and it has the advantages of low cost and high precision. It can meet the needs of field work and is used in mineral resources exploration widely. The dual frequency IP scanning surface design area is 8km² and net-work is 100 * 20m, and the measured depth of IP is 18 and the distance between measuring points is 40m. After rectification, it supplies power to the dual frequency transmitter so as to ensure the quality of the data.

The wide band electromagnetic law is a new frequency domain electromagnetic method. Based on the redefinition of resistivity, a component can be used to observe the multiple components so as to obtain the resistivity calculation and get the desired geological information. Compared with the traditional frequency domain electromagnetic
method, the wide band electromagnetic method only needs to measure the electric field component $E_x$, but does not need to measure $H_y$. It can calculate the apparent resistivity accurately. The supply current is $I$, the length of the power supply is $dL$, the wave number is $k$ and the distance between electrodes is $MN$. The reciprocal of resistivity $\rho$ and conductivity $\sigma$. When the horizontal current source transmits electromagnetic waves, the electromagnetic field can be obtained with the horizontal component $E_x$ of the electric field:

$$E_x = \frac{I \rho dL \cos \varphi}{2 \pi r^3} F_E - E_x^{db}$$

(1)

The formula for calculating the resistivity of wide area is obtained:

$$\rho_d = K_{E-E_x} \frac{\Delta V}{MN} \frac{1}{I} F_E - E_x^{db}$$

(2)

In formula (2), the formulas are:

$$F_E - E_x = 1 - 3 \sin^2 \varphi + e^{-ikr} (1 + ikr)$$

(3)

$$\Delta V = E_x \cdot MN = \frac{IdL \rho}{2 \pi r^3} F_E - E_x^{db}$$

(4)

$$K_{E-E_x} = \frac{2 \pi r^3}{dL \cdot MN}$$

(5)

The wide area electric sounding instrument used in this paper is GDP32- II Electrical instrument and ranging point design is 25m and 50m. The distance between the 3 points in the fourth test area is 25m, and the rest are 50m. The working principle of the transceiver is set to 9km and current $I=7 \sim 22A$.

The survey of gold mine is based on IP sounding and electromagnetic sounding mainly. It also includes the geological anomaly measuring point. All the coordinates of the parameters are adjusted according to the GPS and a higher accuracy of the GPS point is used to conduct point measurement. In the measurement process, base points are used for stranding. In order to ensure the consistency of geophysical exploration instruments, the consistency check of the 5 measuring points is carried out to ensure the reliability of the observation results and the quality of the data. Because the GDP32 device has 7 channels, it is necessary to check the consistency of all channels. The test results are shown in figure 4. It can be seen in figure 4 that the equipment meets the requirements of exploration and can be applied to the specific field exploration work.

All the data collected in the field are imported into the computer. Remove the interference of the larger data and finally sorted into a form file, which is easy to draw into a map. The 2D inversion method is used to obtain the initial model. Through the analysis of different types of curves, the geological structure of the area can be divided into a more accurate interpretation. In addition, the apparent resistivity frequency plane profile is drawn. The ordinate is the set frequency and the abscissa is the line number. Based on the analysis of the profile, the distribution of faults and the characteristics of the electrical layer are obtained.

4. Analysis of gold metallogenic prognosis

4.1 Dual frequency IP scanning exploration results

We obtained the contour map of the dual frequency IP scanning surface in 5 detection areas in the mining area in this paper. Figure 5 is the isoline map in the area of I, and Figure 6 is the abnormal distribution of dual frequency IP scanning surface in the mining area.
Study on Gold Mineralization Prediction Method Based on Dual Frequency IP Method and Wide Area Electromagnetic Method

The Figure of apparent amplitude and frequency of the 120 line IP sounding in this mining area is shown in figure 7:

![Fig. 7 The apparent frequency of the 120 line induced polarization sounding in the I area of the mining area](image)

It can be seen from figure 5- figure 7 that a total of 5 IP anomalies are found in the area. (1) The abnormal area of the 1 is located between the 121-125 lines with a wide range of anomalies. Due to the presence of expertise in the region, it is estimated that the region affected by the impact of a certain metal pipeline. (2) No. 2 abnormal area is located between 118-122 lines. The anomaly area is relatively narrow, and is located in the Quaternary stratigraphic coverage area. It is expected that the area is caused by quartz veins containing metals. (3) No. 3 abnormal area is located between 118-122 lines. The buried depth of the anomaly area is shallow, and it may be caused by quartz veins or metal sulfides. (4) The No. 4 IP anomaly is located between the 114-116 lines. It has a narrow range, showing a low resistance polarization phenomenon and it should be caused by metal sulfides. (5) The No. 5 IP anomaly is located between the 116-119 lines. The abnormal area is at the end of the line.

In addition to I area, the rest of the district also has some anomalies. There are some small anomalies in the V area. The area contains a small amount of metal sulfide, which shows that the survey area is not good to find the future of gold and should not carry out follow-up work. The distribution of low resistivity anomaly is relatively wide in the whole mining area. This is because the distribution of quaternary. Due to the influence of the surrounding tailings, there is a low resistivity anomaly in the east.

4.2 Wide area electromagnetic exploration results

18 exploration lines for wide area electromagnetic sounding exploration were set. 3 exploration lines were set up of 25m in IV area and 15 exploration lines with 50m point ate set in the northern area setting. The wide area electromagnetic exploration of the exploration profile was helpful to find favorable metallogenic area. Exploration by MT obtained 2D resistivity inversion and results study is shown figure 8. It can be seen from figure 8 that reflected in the inference layer was more obvious, showed a low resistance anomaly. It was found that the metal sulfide ore body was found by drilling and the thickness was about 30m, which had a good exploration effect.

![Fig. 8 Inversion and interpretation of magnetotelluric sounding in mining area](image)

Figure 9 shows the 2D resistivity inversion of the wide band electromagnetic method on the 92 line. Part of the identification of the figure is the location of the borehole and the blue dashed line is the main fracture surface of the strike fault. The red ellipse is known as the orebody and the resistivity curves of the known ore bodies show a significant downward trend. This is because the rock is broken, the fault is relatively developed, and there are more metal
sulfides, which verifies the rationality of the wide area electromagnetic prospecting method. The resistivity curve rises obviously at the -1000 height of the 3100-3400 measuring point. This is due to the weakening of mineralization in the area with the low degree of rock fragmentation and the reduction of metal sulfide. The trend of resistivity curve is obvious at 5000-6300 below the elevation of -2000m. The results show that the fracture is developed and the metal sulfides are more. Therefore, it is necessary to further analyze its metallogenic conditions.

![Fig. 9 Wide area electromagnetic sounding inversion and interpretation of L92 line in mining area](image)

It can be seen from Figure 10 that there is a low resistance anomaly in the range of -700 to -900m between the 1800-2200 measuring points. The deep resistivity of the section is relatively low, so it is speculated that there is a very significant field source effect. It also needs to be validated by subsequent further exploration.

![Fig. 10 Wide area electromagnetic sounding inversion and interpretation of L166 line in mining area](image)

5. Conclusions

With the increasing degree of gold mining, gold mining in China has extended from shallow to deep gradually. It is difficult to meet the requirement of depth and precision for the traditional gold ore prediction method. Therefore, it is necessary to make use of the modern comprehensive geophysical prospecting method. Double frequency induced polarization method and wide area electromagnetic method were used to predict the occurrence of gold deposits in Jiaodong area in this paper, which had certain reference significance to the research of gold ore prospecting method in our country. This section was divided into the I ~ V measured area. Wide field electromagnetic were divided into 25m and 50m point. Among them, there were 3 point distance with 25m and 15 point distance with 50m. It can be seen through the actual survey that the method can be used to find the gold deposit effectively in the L92 section of the mine. However, it was necessary to pay attention to the interference of some low resistance anomalies. The geophysical prospecting work such as IP sounding and wide area electromagnetic sounding were carried out in the mining area, and 2 low resistivity anomaly zones and 44 geophysical prospecting targets were found. It was concluded that there may be a metallogenic space at the intersection of the steep faults in the east of the fault zone. However, the physical prospecting method was likely to be interfered by the surrounding environment, and it needed to be verified by the later drilling.

6. REFERENCES


