A Big Earth Data Platform for Three Poles

**Application of tensor CSAMT with high-power orthogonal signal sources in Jiama porphyry copper deposit in Tibet (2021)**

1、Description

The Jiama porphyry copper deposit in Tibet is one of the proven ultra-large-scale copper deposits in the Qinghai-Tibet Plateau at present, with the reserves of geological resources equivalent to nearly 20×106 t. However, it features wavy and steep terrain, leading to extremely difficult field operation and heavy interference. This study attempts to determine the effects of the tensor controlled-source audiomagnetotellurics (CSAMT) with high-power orthogonal signal sources (also referred to as the high-power tensor CSAMT) when it is applied to the deep geophysical exploration in plateaus with complex terrain and mining areas with strong interference. The test results show that the high current provided by the highpower tensor CSAMT not only greatly improved the signal-to-noise ratio but also guaranteed that effective signals were received in the case of a long transmitter-receiver distance. Meanwhile, the tensor data better described the anisotropy of deep geologic bodies. In addition, the tests also show that when the transmitting current reaches 60 A, it is still guaranteed that strong enough signals can be received in the case of the transmitter-receiver distance of about 25 km, sounding curves show no near field effect, and effective exploration depth can reach 3 km. The 2D inversion results are roughly consistent with drilling results, indicating that the high-power tensor CSAMT can be used to achieve nearly actual characteristics of underground electrical structures. Therefore, this method has great potential for application in deep geophysical exploration in plateaus and mining areas with complex terrain and strong interference, respectively. This study not only serves as important guidance on the prospecting in the Qinghai-Tibet Plateau but also can be used as positive references for deep mineral exploration in other areas.

2、Keywords

Theme：porphyry copper system,Jiama,Tensor CSAMT of 150 kw High power,Others  
Discipline：Solid earth  
Places：Jiama， Tibet  
Time：2021

3、Data details

1.Scale：None

2.Projection：

3.Filesize：5.112MB

4.Data format：None

4、Space scope

|  |  |  |
| --- | --- | --- |
| - | north：29.8 | - |
| west：92.0 | - | east：92.4 |
| - | south：29.0 | - |

5、Time frame:None--None

6、Reference method

References to data:

HE Rizheng . Application of tensor CSAMT with high-power orthogonal signal sources in Jiama porphyry copper deposit in Tibet (2021). A Big Earth Data Platform for Three Poles, doi:10.31035/cg20210652022

References to articles:

7、Supporting project information

Deep Probe of Geophysical Techniques for typical ore concentration area  
the Projector of China Geological Survey

8、Data resource provider

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