

ABSTRACT

In china, because of excessive consuming of known resources and continuous lack of durative investment in reconnaissance, many metal mines appear the different-degrees crises in resources, and the lack of them has become an important factor which is restricted by continuous develop of mining in our country. In this case, exploring mine has become an important approach putting off resource pressure in mine .The system of resistance imaging. Based on EH-4 is a method of physical geography, which can resolve accurate three-dimension shape, scale, varieties and partial structure, and has a high resolution and a moderate reconnaissance-depth (20m~1200m). But when collecting data, we have many requirements of electromagnetism-disturb on near field.

This thesis first sets forth the basic theory on the system of resistance imaging based on EH-4, data collecting and the basic method of pretreatment, introduces the basic principle of bringing out quiet displacement and data processing, then discusses the influent factor of the sounding method in high-frequency magnetotellurics when collecting data on this field. It mostly have three aspect: the first is the influence of individual factors, such as the length errors of measuring electrode, the level errors of magnetic sticks; the second is the active noise which roots in human action, such as low frequency communication, broadcasting station, landform and the fluctuation of electric net and so on; the third is the passive noise which is called the geological noise or the static effect and the influence of landform, means the disturb of asymmetry substance.

This thesis describes the basic principle of the one-dimension inversion (Bostick) and the two-dimension inversion (RM 2D), and RRI. Thereby, it resorts to three material examples which is the production of the sounding method in high-frequency magnetotellurics (the uranium mine of Jiechaipin County in Guangxi Province, aluminium-soil mine in henna province and

the gold mine of Lingshou County in Hebei province). The thesis uses the apparently different resistance-inversion (the apparent resistance Basokur defined and the apparent resistance Cagniard defined) as the Comparison, and indicates that new apparent resistance has higher resolving power to middle layer, and effectively increases the inversion effect on thin layer, in contrast with conventional apparent resistance.

KEY WORDS high-frequency Magnetotellurics, the system of resistance imaging based on EH-4, reconnaissance of metal mine, resistance, inversion method