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Geotemperature filed characteristics of laizhou Bay, Jiaodong Peninsula, China

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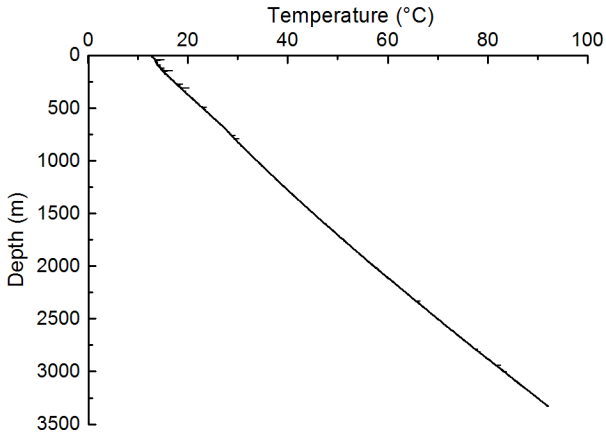
Jiaodong Peninsula is of typical basin-range structure area, which is located in the southeast marginal regions of the North China Craton and the east of the Tanlu fault zone. The strata rocks in this area are mainly Precambrian basement rocks and ultrahigh pressure metamorphic rocks. The intensely developed Mesozoic tectonic-magmatic activities and endogenetic hydrothermal gold metallogenic turned it into a rare large gold centralized area. To investigate the deep mineral resources and reveal the geotemperature gradient for the metallogenic analysis, a deep drilling project was carried out and the final drilling depth reached 4,000 m. This study mainly presents the primary findings of the geotemperature field characteristics.

Both the borehole temperature and core thermal conductivity were measured through a continuous data acquisition system and a thermal conductivity-scanning device. The temperature-sampling interval is 0.05 m and the measurement resolution reached up 0.1°C. In addition, the measurement accuracy of the thermal conductivity reached ±3%. In the end, the depth of the measurement of geotemperature reached 3515.84 m, and the core thermal conductivity covered the full-length of the drilling hole. After data processing and analysis, same important geothermic parameters, such as the geothermal curve, geotemperature gradient, and terrestrial heat flow value, were obtained to analyse the characteristics of temperature field.



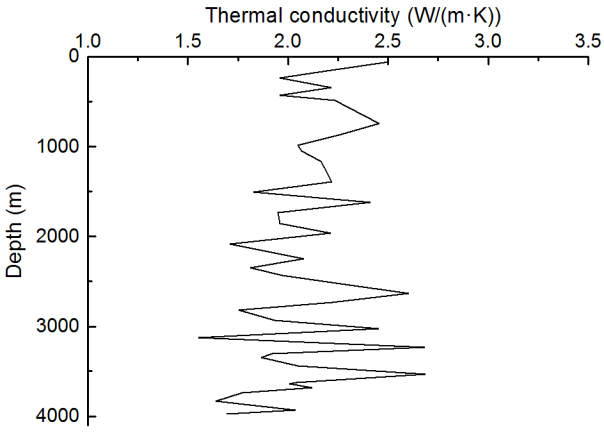


Figure 1: Continuous temperature logging curve

*Figure 2:T*hermal conductivity of rocks vs. depth

The measured geotemperature of the drilling hole was drawn in Fig. 1. It can be seen that the geotemperature almost linearly increases with the depth despite of a few minor deviations in the

shallow ground. Furthermore, the least square method has been applied to get linear curve fitting, the result shows that the geotemperature gradient is 23.9 °C/km. The changes of thermal conductivity of rocks vs. depth are shown in Fig.2. It can be seen the thermal conductivity is comparatively concentrated and it's average reaches 2.09 W/(m·K). In addition, the calculated results indicated the terrestrial heat flow density is 50.53 mW/m^2, which is also a normal gradient value compared with other place.