

The essence of temperature and the regularity of geothermal distribution

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Abstract: The traditional view is that temperature is the intensity of thermal motion of a great number of molecules. However, it can not interpret the existence of the constant geothermal gradient reasonably. This paper advances that temperature is composed of the thermal motion of a great number of molecules and microparticles. The density of microparticles in the earth is closely related with gravitational field, and the temperature distribution in the earth is the function of gravitational field. The density of microparticles in the earth is larger than that on the surface; the temperature in the earth is higher than that on the surface. This paper not only improves the thermal vibration theory, but also finds out the reason that geothermal gradient keeps constant.

Key word: temperature; measure; geothermal gradient; thermal motion of molecules

1 Put forward the problem

Temperature is a physical quantity that shows the state of matter. So, why does high or low temperature of the material ^[1] exist?

As we all know, what the thermometer measures is the temperature, which is the physical quantity that describes the hot and cold degree of matter. To determine the temperature of the material quantitatively, it is necessary to conduct the temperature measurement. But what on earth is the temperature? What does the thermometer measure? This issue deserves an in-depth discussion and reflection.

2 Cognitive developments on the temperature

People's awareness of this issue has undergone a lengthy process ^[2]. Ever since the human have learned to make use of fire, the thermal phenomena were contacted to. However it was from the 17th century that the essence of thermal phenomena really began to be studied. At that time, the awareness of the problem on nature of heat has formed two different points of view, which were the "Heat and Mass Transfer Theory" and the "Movement Theory".

"Heat and Mass Transfer Theory" holds that there is a kind of no weight liquid, called Heat and Mass Transfer (also known as hot-Su), which can access to all the material inside. The thermal content of material is more than the temperature will be high, and with less thermal content, the temperature is low. Moreover, the heat and mass transfer of material can flow spontaneously from the material of the high temperature to that of low temperature, as the flow of water is from the high to the low.

"Movement Theory" views that heat constitutes a material movement of particles, and some people still directly advanced the hypothesis that heat is molecular motion.

Conventional concept is that: the intensity of molecular random motion increases with temperature increasing. The heat transmitted from the high temperature of matter to the low temperature of matter. However, this theory will encounter phenomena which are difficult to explain, such as: why is the temperature of the interior of the earth has been higher than that of the surface? Why the temperature inside the earth maintains in the basic constant state? This is shown in figure 1. One hypothesis is that the thermonuclear reaction in the interior of the earth provides heat dissipation that the planet conducts outward. Another hypothesis is that during the formation period of the earth, heat dissipation has not yet finished in the interior of the earth. According to any hypothesis, the earth must ultimately become a cold ball with uniform temperature. These two hypotheses both can not explain why the internal temperature of the stars people observed is higher than that of the surface.

3 Temperature is sum of thermal motion of molecules and the thermal motion of microparticles.

If it is in accordance with the thermal conductivity theory, heat in the interior of the earth will deliver continuously to the surface. But in fact, it is not the case. The temperature at different depths of the stratum is fundamentally constant. Therefore, heat transfer theory can not explain the geothermal gradient.

First of all, clarify what the thermometer measures? Is what the thermometer measures only the thermal motion of molecules talked about now? The author believes that there are two aspects of the thermometer measures. On the one hand, the thermal motion of molecules is measured; on the other hand, the thermal motion of microparticles (even smaller than the atom, such as photon, and particle smaller than the photon) is measured. These two aspects together act on the

thermometer and co-reflect the temperature of the material.

Temperature of the material = the thermal motion of molecules + the thermal motion of microparticles.

Endothermic process of the material is the process that the material absorbs particles; the temperature rises after the absorption of heat. Exothermic process of the substance is the process that the substance releases particles; the temperature reduces after the material releases heat^[3].

This theory can explain temperature gradient problems in the interior of the earth.

The distribution of gravity field in the interior of the earth is different. Gravity field and other physical fields are composed of the particles^[3]. In different places, gravitational field is different; the density of particles and the energy within per unit volume are different. The more to the interior of the earth, the greater density of microparticles is, as well as the higher temperature of the thermometer measurements. Gravitational field will not be passed from the interior to the surface of the earth, and the density distribution of microparticles will not be passed from the interior to the surface of the earth. Therefore, heat in the interior of the earth will not be delivered to the surface of the earth.. Here said "no" means "not automatically". This reveals mystery that the internal temperature of the earth and the stars has always been higher than the surface area.

If one object is put from the surface of the earth into the interior of the earth, microparticles in the interior of the earth will penetrate into the interior of the object, the temperature of the object increases gradually, and finally reaches to the original ambient temperature of the point where the object is. If the object is retaken back to the ground, microparticles inside the object would spread towards the surrounding environment, and the temperature of the object decreases gradually. Of course, it also can slow down the thermal diffusion rate by insulation materials.

If the thermometer is placed inside the vacuum tube, in accordance with the theory of molecular thermal motion, because no molecules collide with the thermometer, there should be no temperature. But actually, the thermometer shows the temperature. The reason is that the thermal motion of microparticles can act on the thermometer.

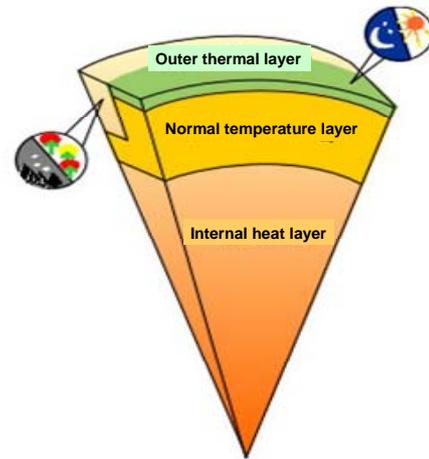


Figure 1 The temperature in the earth

4 Conclusions

The temperature of the material is formed of the molecular thermal motion and thermal motion of microparticles together. The density distribution of microparticles within the earth is closely related to the distribution of gravity field. The temperature distribution within the earth is a function of gravity field. The density of microparticles within the earth is greater than that of the surface. And the temperature of the interior of the earth is higher than that of the surface.

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