

The Earth's internal structure explained from a viewpoint of the condensed matter physics

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Pressure in the Earth increases with increasing depth. The potential energy of electron of substances is lowered by the contraction caused by the pressure. When it comes to the state of lower energy, the substance releases the extra energy. By the way, a meteorite crash forms a crater. Substances concerned with the crater will be heated at an instant by the impulsive contraction. But, the energy of the heat is absorbed by the expansion at immediately after. The energy of the collision is able to change the form of substance at a limited area. But, the main part of the heat source on inner Earth is explained as the resultant of accumulation of substances. That is, the steady–state temperature in center of the Earth is 7000°C at the highest. It corresponds to the electronic states of 0.63 eV. The resultant electronic state is able to describe the circumstances as follows.

The interactions among electronic orbits increase according to increase of depth in the Earth. The state of the substance is adapted to the situation by replacement of adjacent atoms caused by thermal motion. The interactions among those electronic orbits are possible to produce the lower energy state. The state with the low energy produces the extra energy. The extra energy contributes to the heat source of inner Earth. The energy of the heat together with substance is transported from the place with high temperature. That is the mantle convection. The mantle that is beneath the oceanic crust carries the heat more than the mantle under the continental plate. So, the magma emerges onto the ocean floor.

The core of Earth's interior structure can be explained depending on the nature of the substance. The liquidity with good electric conductivity in outer core of the Earth is explained by the degenerated state of electron that is occurred by a quantum resonance among overlapped orbits. The degenerated state of electron changes to the lower symmetry according to Jahn–Teller–Theorem. This state of the lowest energy corresponds to the solid state of inner core that makes possible to propagate a transverse wave.

The proposing concrete explanations are as follows. (1) Heat source of the mantle convection, (2) Heat source of volcano in the sea plate subduction zone, (3) Metallic state on the outer core of the Earth, (4) Solid state on the inner core of the Earth, (5) The formation of the solar system, and (6) The formation of terrestrial planets. The details are presented at the website: (<https://www.youtube.com/watch?v=GMmvjU2CdKM&feature=youtu.be>).