

Heat flow in the solid Earth and changes in length of day

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Long time changes in length of day (LOD) in the outer core are formed in stable layers near the core mantle boundary (CMB) and the cooling inner core boundary (ICB). We assume that the outer core is compressible. We determine the magnitude of changes in the LOD. We exclude the effects of a thermal wind because there are many ambiguous factors in the inner core. As a result, variations of the angular momentum are $-7.23 \cdot 10^{-5}$. If the growth of the inner core to the present time since the radius of the inner core to be 375 km, is 2.7 Ga (Kumazawa et al., 1994) and 1.0 Ga (Labrosse et al., 2001), the rate of variations of the angular momentum is $0.87 \cdot 10^{-13} \text{ yr}^{-1}$, and $-2.35 \cdot 10^{-13} \text{ yr}^{-1}$. These values are less than the rate of the long time variations from tidal variations known in the present time $d\omega/\omega = -3.8 \cdot 10^{-10} \text{ yr}^{-1}$ (Rochester, 1973).

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