

Calculation method of the compliance parameters of the Earth's rotation: Influence of the fluid core and the solid inner core

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Effect of non-rigidity of the solid Earth exerted on the tide and rotation is significant for understanding dynamical behavior of the core and mantle. The influence of the fluid core on the Earth's rotational motion is predictable with high precision based on the semi-analytic theory developed by Sasao et al. (the so-called Sasao-Okubo-Saito theory). This theory was expanded afterward into the theory incorporating not only the influence of the fluid core but also that of the solid inner core through a series of theoretical studies by Mathews et al. (the so-called Mathews-Herring-Buffett theory). Within the previous papers completing these SOS and MHB theories, however, there may exist a few unexplicit parts in terms of numerical procedures. It is considered to be valuable to re-definitize the above-mentioned semi-analytic theory. The present study, therefore, describes how to compute each of the important parameters included in the SOS and MHB theories semi-analytically by means of Saito's calculation method of quasi-static deformation in as much detail as possible. As a result of the computation, most of the individual parameters listed in the previous studies can be reproduced almost perfectly.

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