



三轴液核地球自转的动力学方程

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Dynamic equations for the triaxial fluid-core rotation of the Earth

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- 摘要
- 参考文献
- 相关文章

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摘要 整体地球自转动动力学的理论研究一般是在旋转对称模型基础上进行的,并得到了一系列与观测相符合的结论.但实际上地球是一个非旋转对称的椭球体,甚至是梨形椭球体.因此,三轴地球模型的自转理论研究应该是具有一定意义的.在所有量保留到极移平方量级而忽略其更小量级的情况下,给出了三轴液核地球自转的动力学方程.研究指出,在此精度上三轴液核地球自转的动力学方程是线性耦合的,并得到了三轴液核地球自转的4个本征频率.同时指出,如果在推导过程中保留更小量级,则液核地球自转动力学方程是复杂的非线性方程组,它没有解析解.

关键词: 三轴地球模型 液核 本征频率

Abstract: In general, the research on Earth rotational dynamical theory is based on the model of its rotary symmetry, and the theory obtained a series of conclusions that were coincident with observation. In practice, the earth is a non-rolling-symmetry ellipsoid, so much as is an ellipsoid as a pear. Therefore, the theoretical researches on triaxial Earth model should have definite meanings. This paper, in the instance of held magnitude of square of the polar motion and ignored lesser magnitude for all parameter in deductive process, presented dynamical equations for the triaxial fluid-core rotation of the Earth. The results showed that, these dynamical equations are linearity and coupling in the precision mentioned above, moreover, obtained four normal frequencies of the triaxial fluid-core rotation of Earth. At one time, it was indicated that if held lesser magnitude in the deductive process, then the dynamical equation for fluid core Earth rotation will be a set of complicated nonlinear equation, and there is not analytic resolution for the triaxial fluid core Earth mode.

Key words:

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