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Main Factor That Causes the Instabilities of the Earth’s Rotation

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Abstract : Earth rotation is one of astronomical phenomena without which it is impossible to think of human life. That is why the investigation of the Earth's rotation is very important, and it has a long history of study. The invention of quartz clocks in the 1930s, atomic time in the 1950s, and the introduction of modern technology into astronomic observation in recent years resulted in rapid development of the study of Earth’s rotation. The theory of the Earth's rotation, however, has not been up to the high level of astronomic observation due to the limitation of time. As a typical example, we can take the problems that cover the instabilities of the Earth’s rotation, proved completely by the astronomic observations as well as polar motion, the precession and nutation of the Earth's rotation axis, which have not been described in a single equation in a quantificational way from the unique law of Earth rotation. In particular, at present the problem of what is the main factor causing the instabilities of the Earth rotation has not been solved clearly in quantificational ways yet. Therefore, this paper gives quantificational proof that the main factor that causes the instabilities of the Earth's rotation is the moment of external force other than variations in the relative atmospheric angular momentum due to the time limitation and under some assumptions or the moment of inertia of the Earth’s body.

Keywords : atmospheric angular momentum, instabilities of the earth’s rotation, law of the earth’s rotation change, moment of inertia of the earth
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