Cosmology in Terms of Wave Geometry (XI). The Solar System as a Local Irregularity in the Universe.

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§ 1. Introduction and Outline of Theory.

On the motion of the planets in the solar system there exist two famous theories, the classical theory of Newton and the relativistic theory of Einstein. As is well-known, the former succeeded in explaining the three laws of Kepler, and the latter the secular advance of the perihelion of the Mercury orbit, which could not be explained by Newton's theory.

,The purpose of this paper is to build a theory on the motion of the planets in the solar system in terms of Wave Geometry. The outline of the theory is as follows:

Prof. Iwatsuki and one of us have put forward a theory of spiral nebulae.[1] In that theory a nebula was considered as a physical system which might be taken as a local irregularity around a point in the universe. In such a physical system, the physical law is invariantly expressed by the rotation of coordinate system around a spacial point and by the translation with regard to time. In other words, the physical law in such a physical system is expressed in an invariant form by the following infinitesimal transformations:

$$(1.1) \quad \begin{cases} -\cos\varphi\,\dfrac{\partial}{\partial\theta}+\cot\theta\sin\varphi\,\dfrac{\partial}{\partial\varphi}, \\[2ex] \sin\varphi\,\dfrac{\partial}{\partial\theta}+\cot\theta\cos\varphi\,\dfrac{\partial}{\partial\varphi}, \\[2ex] \dfrac{\partial}{\partial\varphi}, \qquad \dfrac{\partial}{\partial t}. \end{cases}$$

As these transformations form a four-parameter group, we shall denote it by G_4. The theory of spiral nebulae in Wave Geometry was established as an invariant theory for G_4.

Since the solar system may also be considered as a local irregularity

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(1) T. Iwatsuki and T. Sibata: This Journ., **81** (1941), 74 (W.G. No. 44), hereafter referred to as I.