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ON THE DYNAMICS OF THE SOLAR SYSTEM I: ORBITAL INCLINATION AND NODAL PRECESSION

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The dynamic equations of the n-body problem are solved in relative coordinates and applied to the solar system, whence the mean variation rates of the longitudes of the ascending nodes and of the inclinations of the planetary orbits at J2000 have been calculated with respect to the ecliptic and to the Laplace invariable plane under the approximation of circular orbits. The theory so obtained supersedes the Lagrange-Laplace secular evolution theory. Formulas for the change from the equatorial and ecliptic coordinates to those of the Laplace invariable plane are also provided.

MSC: 70F10, 70F15
Keywords: Laplace invariable plane, n-body problem, nodal regression, orbital inclination, precession of the ecliptic, solar system

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