

Equation of Motion of a Mass Point in Gravitational Field and Classical Tests of Gauge Theory of Gravity

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Abstract: A systematic method is developed to study the classical motion of a mass point in gravitational gauge field. First, by using Mathematica, a spherical symmetric solution of the field equation of gravitational gauge field is obtained, which is just the traditional Schwarzschild solution. Combining the principle of gauge covariance and Newton's second law of motion, the equation of motion of a mass point in gravitational field is deduced. Based on the spherical symmetric solution of the field equation and the equation of motion of a mass point in gravitational field, we can discuss classical tests of gauge theory of gravity, including the deflection of light by the sun, the precession of the perihelia of the orbits of the inner planets and the time delay of radar echoes passing the sun. It is found that the theoretical predictions of these classical tests given by gauge theory of gravity are completely the same as those given by general relativity.

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Key words: classical tests of gauge theory of gravity, gauge theory of gravity, classical solution of field equation, Newton's second law of motion

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