Classical Gravitational Interactions and Gravitational Lorentz Force

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Abstract: In quantum gauge theory of gravity, the gravitational field is represented by gravitational gauge field. The field strength of gravitational gauge field has both gravitoelectric component and gravitomagnetic component. In classical level, gauge theory of gravity gives classical Newtonian gravitational interactions in a relativistic form. Besides, it gives gravitational Lorentz force, which is the gravitational force on a moving object in gravitomagnetic field. The direction of gravitational Lorentz force is not the same as that of classical gravitational Newtonian force. Effects of gravitational Lorentz force should be detectable, and these effects can be used to discriminate gravitomagnetic field from ordinary electromagnetic magnetic field.

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