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Determination of Gravitomagnetic Field Through GRBs or X-ray Pulsars

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Abstract: In gauge theory of gravity, there is direct coupling between the spin of a particle and gravitomagnetic field, which will affect Landau level. In the surface of a neutron star or near a black hole, the coupling energy between spin and gravitomagnetic field can be large and detectable. Precise measurement of the position of spectrum lines of the corresponding emission or absorption can help us to determine the gravitomagnetic field and electromagnetic field simultaneously. The ratio $\Delta E_e/\Delta E_p$ can be served as a quantitative criteria of black hole. In GRBs or X-ray pulsar, absorption spectral lines of electron were observed. If the absorption spectral lines of electron, neutron and proton can be observed simultaneously, using the method given in this paper, we can determine the gravitomagnetic field in the surface of the star, and discriminate black hole from neutron star.

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