

# Thomas precession and torque

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Special relativity predicts that a spinning object with a constant angular momentum in its rest frame, when transported around an orbit, will undergo the Thomas precession in the laboratory frame. As no torque is applied in the rest frame of the gyroscope, it seems that the principle of conservation of angular momentum is violated. We show that in fact the Thomas precession of the gyroscope is accompanied by a torque when observed in the laboratory frame. The spin dynamics equation (the BMT equation) is presented in terms of a torque applied to the spin. A method of finding an explicit expression for the torque is demonstrated in the case of a gyroscope performing circular motion. An unexpected oscillatory character of the torque is explained in terms of the difference between the proper spin and the spin observed in the laboratory frame.

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