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9. Ordinary Differential Equations and Dynamical Systems

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About some new solutions in a problem about motion of a body in a magnetic field

Some new exact solutions describing some classes of precession motions and conditions of their existence are investigated in a problem about gyrostate's motion in a magnetic field with account of Barnett-London effect . In particular, these solutions describe the semi-regular precession motions of first and second types, the precession motions of general kind in the case when the motion of gyrostate is the precession motion about vertical vector. In the case when the gyrostate's motion is the precession isoconical motion of first, second and general types some new cases of integration of motion's equations are obtained. The conditions of existence of precession motions about an oblique axis as such as Bressan-Hess precession and Grioli precession are obtained for the presented problem.