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Symmetric periodic trajectories of charged particles in Gutsunaev–Manko spacetime

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We consider the motion of charged particles in Gutsunaev–Manko spacetime, which is the exact solution of the Einstein–Maxwell field equations for a massive dipole. In the present work we study periodic orbits symmetric with respect to the equatorial plane. The spacetime is static and axially symmetric, therefore the problem is reduced to the motion in two-dimentional effective potential. We show that the Gutsunaev–Manko solution admits the same types of symmetric periodic trajectories as the classical magnetic dipole problem and study the stability of those trajectories.

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