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Abstract

A complete study of the stability of static equilibrium in the system was carried out using the explicitly obtained function of the potential energy of the magnetic system, which consists of a superconducting ring and a magnetic dipole in a uniform gravitational field. The conditions for equilibrium were analytically found, and the stability domain was constructed. It is shown that when the found conditions are met, a static magnetic levitation in the form of a suspension takes place around the axis of the ring. The performed calculations demonstrate the stability of equilibrium in the form of a suspension based on the magnetic levitation mechanism proposed by V. Kozoriz.

Keywords: mathematical model, magnetic levitation, magnetic potential energy, stability of equilibrium, superconducting coil, permanent magnet.