

Turkish Journal of Physics

Turkish Journal

of

Physics

Magnetic Levitation of a Small Magnetic Ring Above Cylindrical Superconductor Sample in the Meissner State

H. M. AL-KHATEEB, F. Y. ALZOUBI, M. K. ALQADI and N. Y. AYOUB

Department of Physics, Jordan University of Science and Technology, Irbid-JORDAN

Department of Physics, Yarmouk University, Irbid-JORDAN

School of Natural Applied Sciences, German Jordanian University, Amman-JORDAN

e-mail: hmkhateeb@yahoo.com or hkhateeb@just.edu.jo

 [Keywords](#)
[Authors](#)



phys@tubitak.gov.tr

[Scientific Journals Home](#)
[Page](#)

Abstract: The levitation force between a cylindrical superconductor in the Meissner state and a small magnetic ring was calculated using the dipole-dipole interaction model under the assumption that the magnetic ring is small compared with the physical dimensions of the system. We obtained analytical expressions for the levitation forces as a function of the geometrical parameters of the ring and the superconductor sample as well as the height of magnetic ring. We analyzed the levitation force in two configurations of the magnetic moment of the small ring with respect to the surface of the superconductor: one horizontal in which the magnetic moment is parallel to the surface of superconductor and the other vertical in which the magnetic moment is perpendicular to the surface of superconductor. The levitation force for vertical configuration is always higher than that for horizontal configuration. Also, the force in vertical configuration does not depend on the geometry of the magnetic ring.

Key Words: Levitation force; Meissner state, superconducting cylinder

Turk. J. Phys., **31**, (2007), 271-278.

Full text: [pdf](#)

Other articles published in the same issue: [Turk. J. Phys., vol.31, iss.5.](#)