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Experiments on Inductive Magnetic Levitation with a Circular Halbach Array IAN BEAN, DOUG GONCZ, AUSTIN RAYMER, JASON SPECHT, RICARDO ZALLES, WALERIAN MAJEWSKI, Northern Virginia Community College — Using a ring Halbach array, we are investigating a repulsive levitating force and a drag force acting on the magnet from a ring of inductors rotating below the magnet. After measuring induced currents, voltages and magnetic fields in the individual inductors (in the form of short solenoids), we investigated the dependence of lift/drag forces on the speed of relative rotation. The ratio of lift to drag increases with the angular velocity, as expected from a related theory of the induction effects in a linear motion. We are experimenting with the shape and density of inductors, and their material, in an attempt to maximize the lift at a minimal velocity of rotation. Eventually this design could have applications as frictionless bearings or as frictionless gear in a wide range of systems, especially in machinery that cannot be easily accessed.

Walerian Majewski
Northern Virginia Community College

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