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**Inductional Effects in a Halbach Magnet Motion Above Distributed Inductance** YVES TCHATCHOUA, ARY CONROW, DONG KIM, DANIEL MORGAN, WALERIAN MAJEWSKI, ZAEEMA ZAFAR, Northern Virginia Community College, Annandale, VA — We experimented with attempts to levitate a linear (bar) Halbach array of five 1” Nd magnets above a linear inductive track. Next, in order to achieve a control over the relative velocity, we designed a different experiment. In it a large wheel with circumferentially positioned along its rim inducting coils rotates, while the magnet is suspended directly above the rim of the wheel on a force sensor. Faradays Law with the Lenz’s Rule is responsible for the lifting and drag forces on the magnet; the horizontal drag force is measured by another force sensor. Approximating the magnet’s linear relative motion over inductors with a motion along a large circle, we may use formulas derived earlier in the literature for linear inductive levitation. We measured lift and drag forces as functions of relative velocity of the Halbach magnet and the inductive “track,” in an approximate agreement with the existing theory. We then vary the inductance and shape of the inductive elements to find the most beneficial choice for the lift/drag ratio at the lowest relative speed.

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