

Abstract Submitted
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Measuring the off axis magnetic field within a Helmholtz Coil

EDWARD PLUHAR, ERIC MARTELL, Millikin University — Helmholtz coils are used because they produce nearly uniform magnetic fields on-axis. Prior research, namely Graf's thin coil experiment [The Physics Teacher, pp. 360 (2012)], has accurately measured the axial magnetic field produced by a thin coil; however, the magnetic field off-axis is known to be significantly more complicated and cannot be calculated analytically. In this research, I have numerically determined the magnetic field off-axis in the region between the two coils and compared those calculations with measured values. I then determined the effect the deviation from uniformity has on the behavior of a charged particle moving through this region, such as in the well-known electron charge-to-mass ratio experiment.

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