

Abstract Submitted
for the NWS10 Meeting of
The American Physical Society

On the magnetic field near the center of Helmholtz coils MICHAEL CROSSER, Linfield College, STEVEN SCOTT, ADAM CLARK, MARSHALL WILT, Centre College — We develop a series expansion for the calculation of the magnetic field near the center of Helmholtz coils and apply the result to a magnet of our design. Our analysis considers geometric details of the coils, the magnetic properties of the form and windings, conductor insulation effects, and several winding imperfections. We also consider the relaxation of coil symmetry which happens when the mean radius of each coil and the coil midplane separation distance are unequal. We compute the field uniformity near the coil's center for three cases, including one where axial symmetry remains but geometric imperfections of the order of 10^{-3} of the coil “radius” exist.

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Date submitted: 30 Aug 2010

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