UNIVERSITY OF CALIFORNIA AT BERKELEY
Department of Civil and Environmental Engineering
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Structural Engineering,
Mechanics and Materials
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Lab 12: 04/28/04
Electromagnet

1. Consider the symmetric electromagnet shown in figure 1. The dimensions are $a = 6cm$, $t = 2cm$ and $g = 0.5cm$. The coils on each side have $N = 250$ windings.

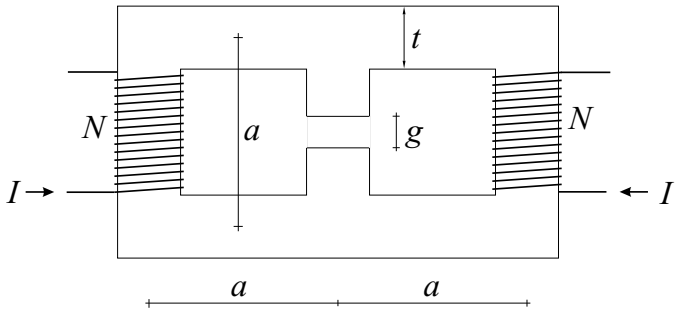

Figure 1: Electromagnet

2. Modell the problem in femlab. The permeability of the magnet is $\mu = 100\mu_0$, with the free space permeability $\mu_0 = 4\pi\ 10^{-7}\frac{T\ m}{A}$.

3. Compute the current I required to have a magnetic field of $B = 0.5T$ in the gap.

4. Use a hand analysis to estimate I.

5. Plot the current $I(g)$ for a changing gap using both femlab and the hand analysis.