

Homework 9

Chapter 23

Problem 2. An $N = 25$ turn circular coil of wire has diameter $d = 1.00$ m. It is placed with its axis along the direction of the Earth's magnetic field of $B = 50.0 \mu\text{T}$, and then in $t = 0.200$ s it is flipped 180° . An average emf of what magnitude is generated in the coil?

Problem 6. A coil of $N = 15$ turns and radius $R = 10.0$ cm surrounds a long solenoid of radius $r = 2.00$ cm and $n = 1.00 \cdot 10^3$ turns/m (Fig. P23.6). The current in the solenoid changes as $I = (5.00 \text{ A}) \sin(120t)$. Find the induced emf in the 15 turn coil as a function of time.

Problem 12. Consider the arrangement shown in Figure P23.12. Assume that $R = 6.00\Omega$, $l = 1.20$ m, and a uniform $B = 2.50$ T magnetic field is directed into the page. At what speed should the bar be moved to produce a current of 0.500 A in the resistor.