

**Answer on Question #68486, Physics / Electromagnetism**

A 20.0 m long wire is carrying a 150.0 mA current parallel to a second wire that is extremely long which carries a current of 250.0 mA in the same direction. These wires are placed 40.0 cm apart in a 5.5 T magnetic field that is directed into the page. Calculate the magnetic force on each wire and indicate the direction of the force. Each of these wires would generate a smaller magnetic field, indicate the direction this magnetic field would travel between the wires.

**Solution:**

Magnetic force:

$$F = \frac{\mu_0 I_1 I_2}{2\pi r} L \quad (1), \text{ where } \mu_0 = 4\pi \times 10^{-7} \text{ T}\cdot\text{m}\cdot\text{A}, I_1 = 150.0 \times 10^{-3} \text{ A}, I_2 = 250.0 \times 10^{-3} \text{ A}, r = 0.4 \text{ m}, L = 20.0 \text{ m}$$

$$\text{Of (1)} \Rightarrow F = 3.75 \text{ N}$$

**Answer:**

3.75 N

attraction