

UOFSC, DEPARTMENT OF PHYSICS & ASTRONOMY.

Graduate student problem competition

NOV 28–DEC 3, 2023

All graduate students are eligible to participate.

To submit your solution, e-mail it to bazaliy@mailbox.sc.edu

Magnetic force

Electric current is injected into one corner of a thin metal plate and collected at another corner, as shown in the figure. The plate has a shape of an equilateral triangle with a side a , with constant thickness that is much smaller than the linear size a , and uniform conductivity. The total injected current is I . The plate is subjected to a uniform magnetic field \mathbf{B} pointing perpendicular to the plane of the drawing towards the viewer. Find the magnetic force acting on the current-carrying plate.

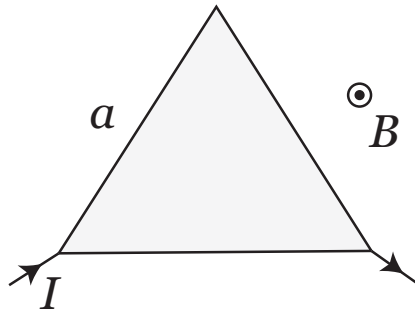


Figure 1: Top view on a plate and current injection points