

MASSACHUSETTS INSTITUTE OF TECHNOLOGY  
Experimental Study Group

Physics 8.022, Spring 2011

**Problem Set 8**  
**Ampère's law, Biot-Savart law**

**Due: Sunday, April 3rd at 9 PM**

**Problem 1: Long flat conductor**

A long flat conductor of width  $a$  carries a sheet of current  $i$  (see Figure 1). You are asked to find the magnetic field (direction and magnitude) near the center of its flat side and very close to the surface, such that the distance  $R$  from the sheet is  $R \ll a$ .

Figure 1: Flat conductor