

Torque on Current Loop – II

This table refers to a square loop in which current is flowing in the presence of a uniform, unchanging magnetic field. Fill in the table to indicate, for each case, whether the x, y, and z components of the magnetic field are positive (+), negative (–), or zero (0), the angle between the magnetic field and the normal to the plane of the loop, whether or not there is a net force on the loop, and whether or not there is a net torque on the loop. Some items are already filled in. (*Note: we are assuming that the normal to the plane of the loop points in the positive direction of one of the coordinate axes.*)

	B_x	B_y	B_z	Angle between magnetic field and normal to plane of loop	Net force on loop?	Net torque on loop?
Loop in xy plane						
B field points toward +x direction	+	0	0	90°	No	Yes
B field points toward +y direction						
B field points toward +z direction						
B field points toward –x direction						
B field points toward –y direction						
B field points toward –z direction						

Loop in yz plane						
B field points toward +x direction	+	0	0	0°	No	No
B field points toward +y direction						
B field points toward +z direction						
B field points toward –x direction						
B field points toward –y direction						
B field points toward –z direction						

Loop in xz plane						
B field points toward +x direction						
B field points toward +y direction						
B field points toward +z direction						
B field points toward –x direction						
B field points toward –y direction	0	–	0	180°	No	No
B field points toward –z direction						