F_{AB} = F_onA_fromB

F_{BA} = F_onB_fromA

A

B

$\mathbf{F_{AB}}$ = $\mathbf{-F_{BA}}$
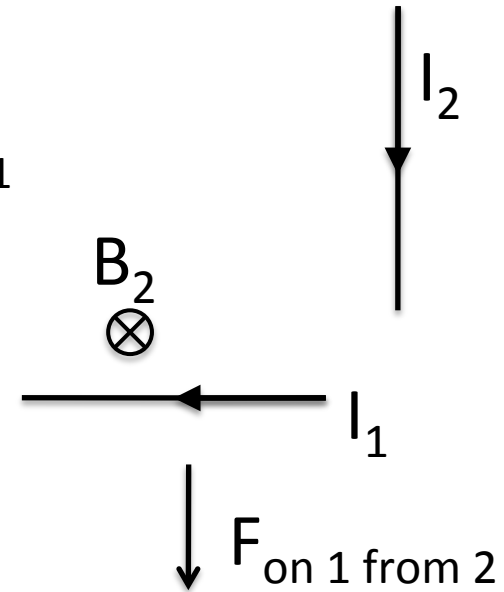
Newton's 3rd Law is equivalent to..

A) Conservation of energy

B) Conservation of linear momentum

C) Conservation of angular momentum

D) None of these. NIII is a separate law of physics.

Two short lengths of wire carry currents as shown.
(The current is supplied by discharging a capacitor.)
The diagram shows the direction of the force on wire 1
due to wire 2.

I_2

B_2
⊗

I_1

$F_{on\ 1\ from\ 2}$

What is the direction of the force on wire 2 due

to wire 1?

A) ⟹

B) ⟸

C) ⇑

D) ⇓

E) None of these

Feynman's Paradox:

Two charged balls are attached to a horizontal ring that can rotate about a vertical axis without friction. A solenoid with current I is on the axis. Initially, everything is at rest.

The current in the solenoid is turned off.
What happens to the charges?

A) They remain at rest
B) They rotate CW.
C) They rotate CCW.

Does this device violate Conservation of Angular Momentum?
A) Yes
B) No
C) Neither, Cons of Ang Mom does not apply in this case.

B

n, I

Q +

R

B

+

Q

C

I
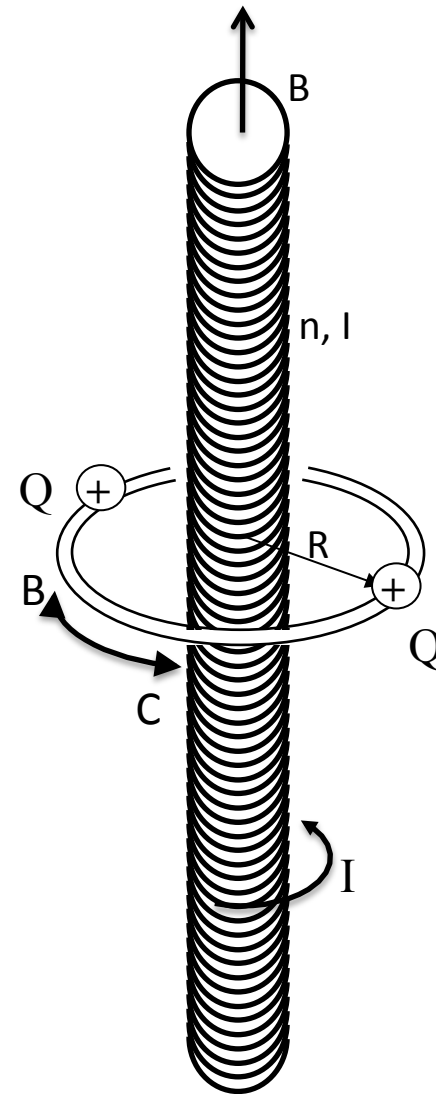
Two charged capacitors discharge through wires. The magnetic field forces are not equal and opposite. After the discharge the momentum of the capacitors is to the lower right. What's the resolution of this Newton's Third Law paradox?
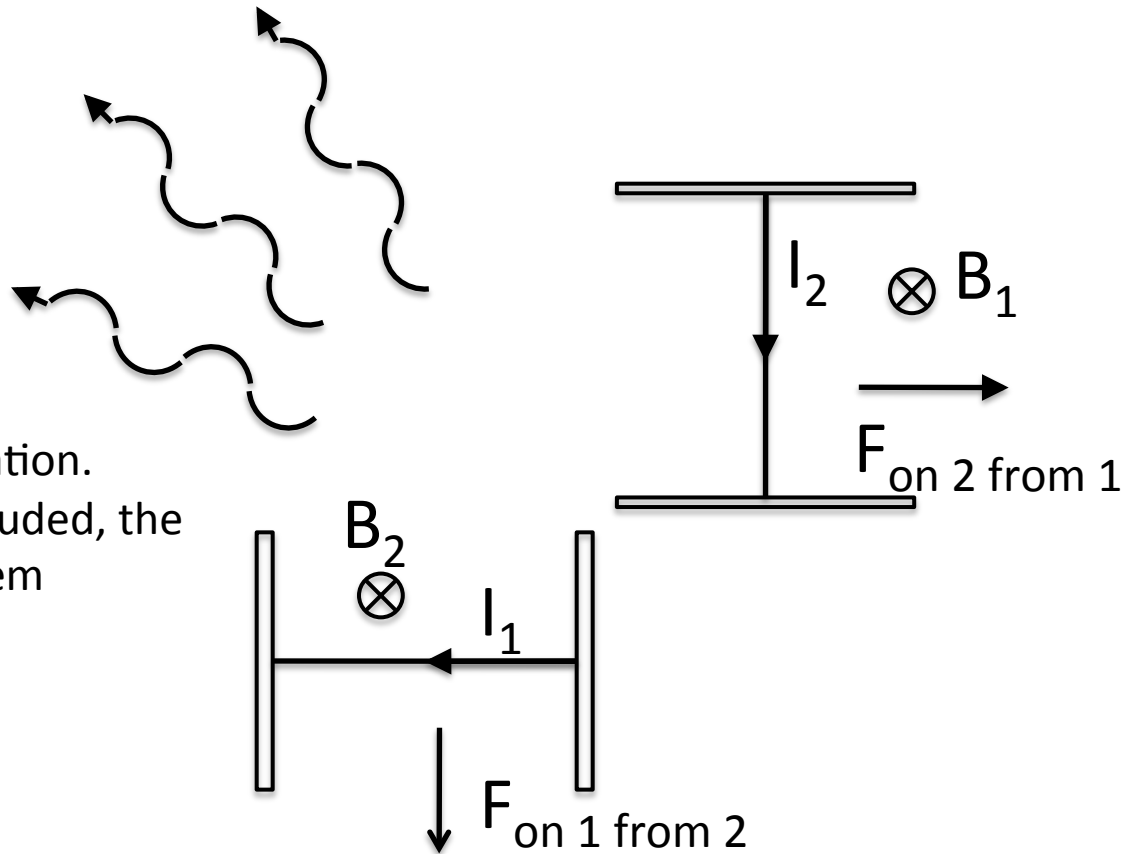
Answer:
Momentum in the EM radiation.
When all momentum is included, the net momentum of the system remains zero.

I_2 $\otimes$ B_1

$F_{\text{on 2 from 1}}$

B_2
$\otimes$
I_1

$F_{\text{on 1 from 2}}$