

Success of the modified Lorentz perpendicular action experiment

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After the fail of a first try of the Lorentz perpendicular action experiment,

(Please see [Lorentz perpendicular action experiment, blogspot academia](#)

[Fail of the perpendicular action experiment blogspot](#))

I have found the cause of the fail and modified the setup to get around it. This time I get a success. The video of this experiment is on Youtube under this link:

<http://youtu.be/iIwtRV9HFTY>

In this video, I have put

- 1) General photograph of the setup
- 2) General video of the test
- 3) Close-up video of the test coil's movement
- 4) Photographs of the magnet and the test coil

The led indicates the presence of current in the test coil. In a magnetic field, the Lorentz force law specifies that the force on the current is always perpendicular to it. But in the experiment, I have found that the magnetic force makes the test coil turn about the x axis and not about the y axis, indicating that the real force is only in the y direction and the force in the x direction is nearly zero.

In the video you can see:

- 1) The test coil's axis is in the x direction, when the led lights up, the coil turns.
- 2) The test coil's axis is in the y direction, when the led lights up, the coil does not turn.
- 3) The led is on and I rotate the test coil, when the axis changes from x to y, the test coil returns gradually to the rest position. This shows that the force on the current changes from strong to zero.

This experiment proves 2 facts:

- 1) In the position of the test coil relative to the magnet, the magnetic force is not perpendicular to the current, that is $\mathbf{F} \neq \mathbf{I} \times \mathbf{B}$.
- 2) Magnetic field cannot transport transversal force, that is, the force perpendicular to the radial line joining the magnet and the current is zero.

The crux of this experiment is that the magnet is very narrow and is in the z direction. Please confirm this result by doing the experiment yourself if you can. If you do not agree with this result, please propose a theoretical magnetic field B that can explain this result.

I will give a detailed report soon.