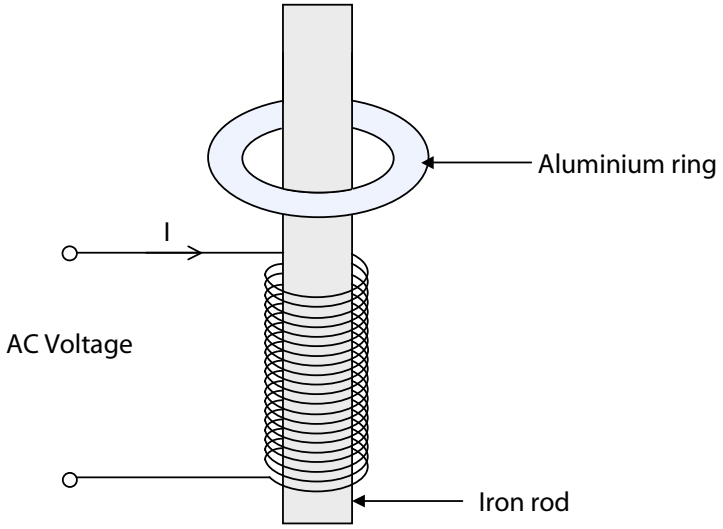
More on Eddy currents



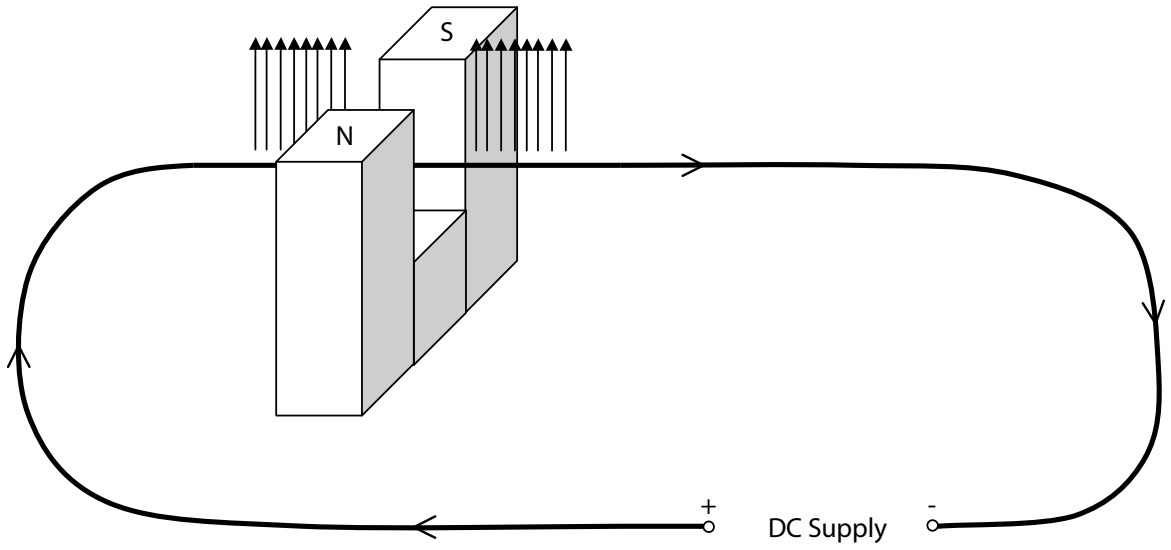
When the current is turned on the flux created by the solenoid suddenly increases. This change in flux linkage causes a current to be induced in the aluminium ring. This induces a flux into the aluminium ring that opposes the changing flux in the solenoid (by Lenz's law). This causes the aluminium ring to jump each time the power is turned on/off.

If AC current is used the ring oscillates and then hovers above the coil. If a non-smoothed DC supply is used then the ring jumps up and down as the power is applied and removed, and whilst applied vibrates at the base of the rod.

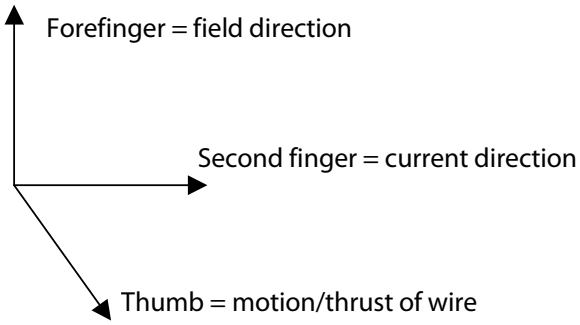
Large or heavier rings do not display this effect so well if the same number of coils is used on the same iron rod.

A ring with a gap in it does not work, as the Eddy currents cannot be channelled around the ring, so no flux is induced.

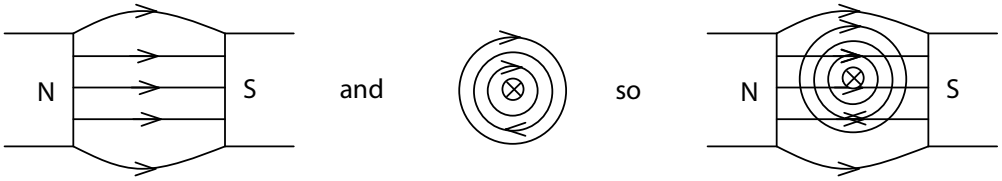
Forces on currents – the motor effect



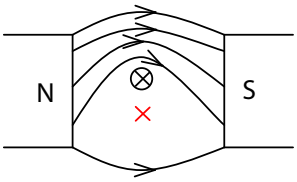
Fleming's left hand rule states that:



Evaluating this using field shapes:



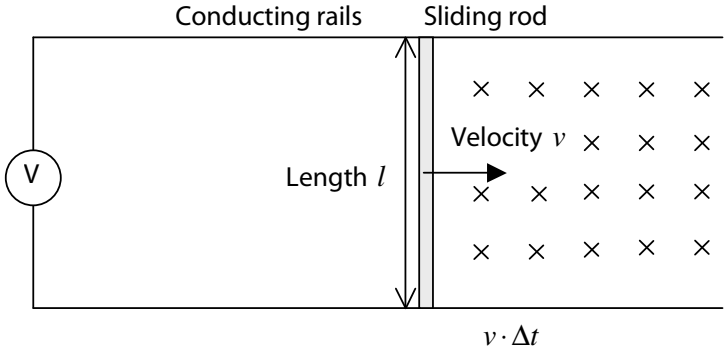
can be simplified to



× represents a neutral area

The condensed flux lines above have an effect like a catapult pushing the wire into the neutral area.

Using Faraday's law of induction to find the force on a current-carrying wire



Not completed.

These notes are from a lesson on 07/10/2004.