eddy current

Eddy
noun: a current of water or air that moves against the main current in a circular pattern
verb: if a current of water or air **eddies**, it moves against the main current in a circular pattern
noun: a miniature whirlpool or whirlwind resulting when the current of a fluid doubles back on itself

Eddy currents (also called Foucault currents) are currents induced in conductors, when a conductor is exposed to a changing magnetic field due to relative motion of the field source and conductor; or due to variations of the field with time. This can cause a circulating flow of electrons, or a current, within the body of the conductor. These circulating eddies of current have inductance and thus induce magnetic fields. These fields can cause repulsive, attractive propulsion and drag effects. The stronger the applied magnetic field, or the greater the electrical conductivity of the conductor, or the faster the field changes, then the greater the currents that are developed and the greater the fields produced.

The term **eddy current** comes from analogous currents seen in water when dragging an oar breadthwise: localised areas of turbulence known as eddies give rise to persistent vortices.

Eddy currents, like all electric currents, generate heat as well as electromagnetic forces. The heat can be harnessed for induction heating. The electromagnetic forces can be used for levitation, creating movement, or to give a strong braking effect. **Eddy currents** can also have undesirable effects, for instance power loss in transformers. In this application, they are minimised with thin plates, by lamination of conductors or other details of conductor shape.

Self-induced **eddy currents** are responsible for the skin effect in conductors. The latter can be used for non-destructive testing of materials for geometry features, like micro-cracks. A similar effect is the proximity effect, which is caused by externally-induced eddy currents. (wikipedia)

See Also

14.04 - Thirds as Currents
Current
Disturbance
eddy current
flow
fluid
laminar flow
pipe
Reynolds number
Levitation
Vibration
Vortex
Wave