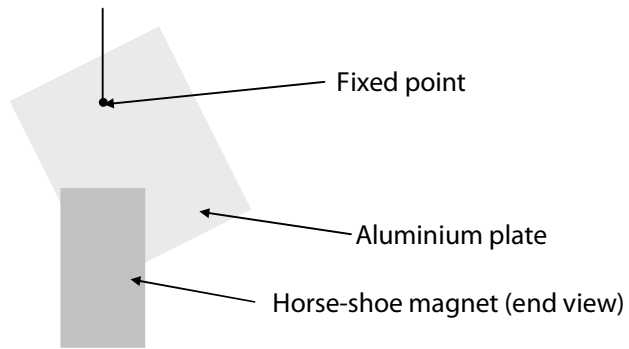
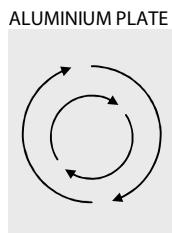


Eddy Currents



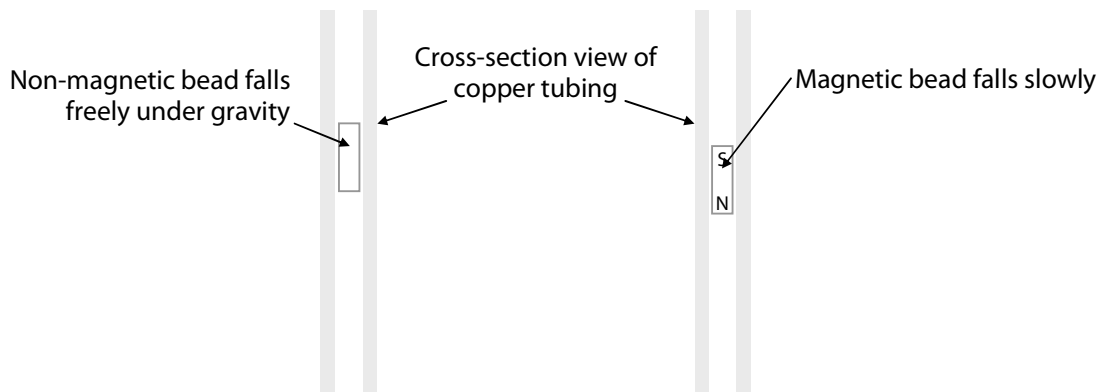
Motion of aluminium plate in magnetic field causes Eddy currents to be induced, so dampens motion of pendulum. The current is not in a prescribed line, instead in a conduction material where the flux changes. The motion of the plate is damped because currents are induced in the plate as it moves in and out of flux.



Circling currents are formed in the aluminium plate. Lenz's law, that the direction of current must oppose the change of flux causes problems in transformers and makes them inefficient by wasting energy in heating the transformer. Laminations can be used in transformer cores to stop the conductance of eddy currents around the core.

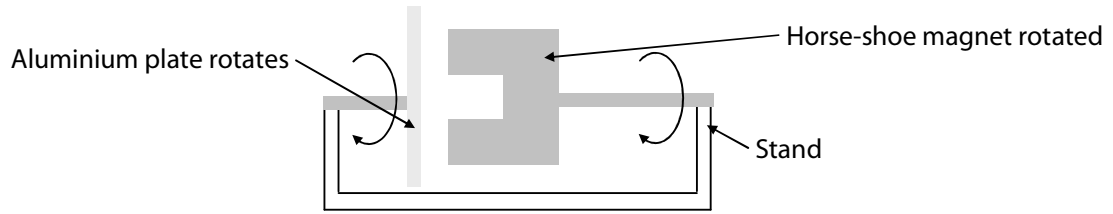


If we repeat the experiment with an aluminium plate with slots cut in the bottom the damping effect is less prominent as the eddy currents cannot flow as freely.



As the non-magnetic bead falls down the tube it falls freely under gravity. The magnetic bead falls much more slowly as it induces Eddy currents in the copper tube. The flux lines cut the copper surface and by Lenz's law produce an opposing magnetic field.

Eddy currents are currents induced in any conducting material in which the magnetic flux changes. A primitive speedometer can also be explained as the rotation of the magnet causes the aluminium plate to rotate.



These notes are from a lesson on 30/09/2004.