Changing electromagnetics fields

Electromagnetics

Static electric fields are independent from static magnetic fields. In dynamic electromagnetic fields changing electric field induces changing electric field and so on.

Induced EMF

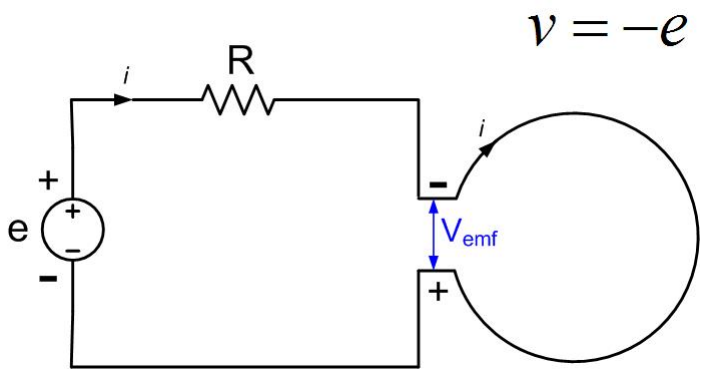

Figure 1: Induced voltage due to a loop of wire with AC current. Voltage induced is due to inductance of the loop of wire.

Motional EMF

Inductance in circuit theory

Example 1. Voltage droop in electronic circuits

Example 2. Ground bounce in electronic circuits

Learning outcomes: Magnetostatic fields.
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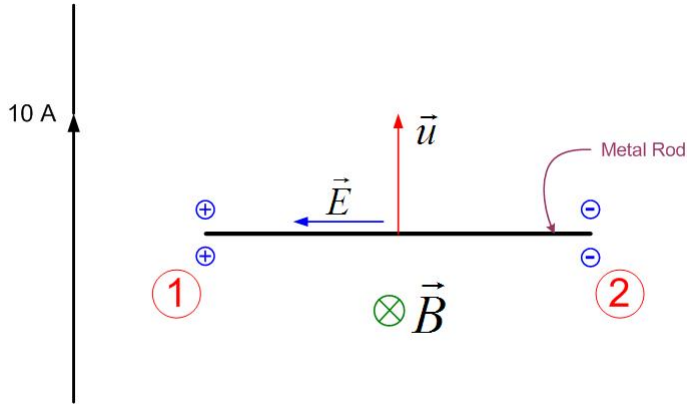

Figure 2: Example of induced motional electromotive force.

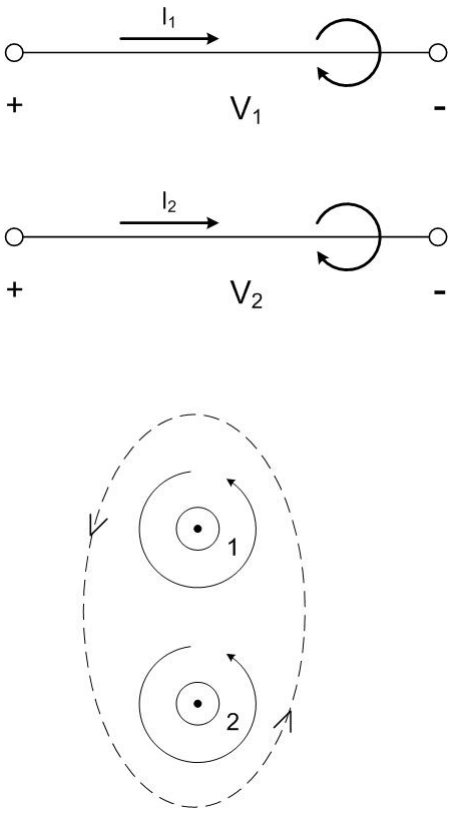

Figure 3: Mutual Inductance: Increasing the magnetic field and therefore current in one wire due to another wire in vicinity.

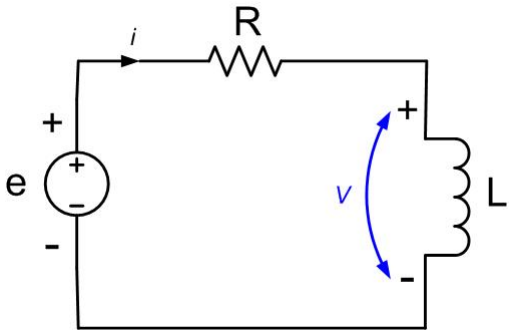

Figure 4: Simple electronic circuit with an inductance and resistance.

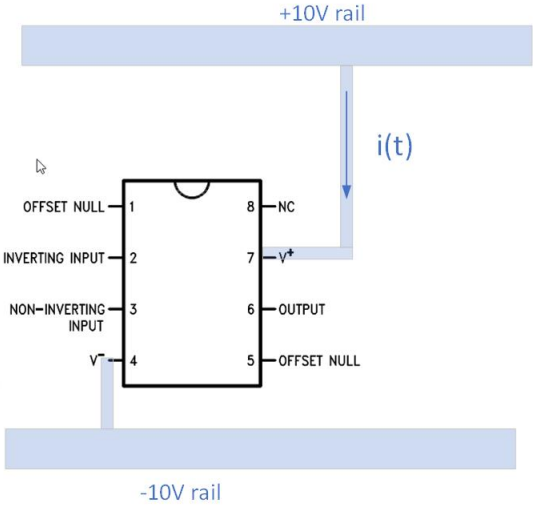

Figure 5: Voltage droop in electronic circuits.

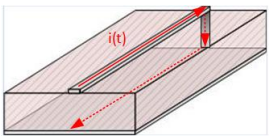

Figure 6: Ground bounce in electronic circuits.