

Answer on Question #45977– Physics – Electromagnetism

Question: when electric charges move in closed loops the forces that is produced is

- a) electrostatic;
- b) magnetic;
- c) gravitational;
- d) nuclear.

Solution: the nuclear force acts between the particles in the nucleus (for example, between protons and neutrons). It is short-range force: beyond a distance of a few times the typical nuclear dimension the force falls off to zero. The gravitational force acts between every particle that has some mass, but it is negligible in comparison with the electrical forces. Electrostatic force acts between charges that are motionless, thus it does not fit in our case. But the moving electric charges produce the magnetic field \mathbf{B} and they can interact with another moving electric charges (currents) according to the Lorentz law

$$\mathbf{F} = e \cdot \mathbf{v} \times \mathbf{B}.$$

Therefore the charges that move in closed loops produce magnetic force.

Answer:

- b) magnetic.