

Answer on Question #59068-Physics -Electromagnetism

An electric field of 50kV/m is perpendicular to a magnetic field 0.25T. What is the velocity of a charge whose initial of motion is perpendicular to both fields and which passes through the fields undeflected?

3×10³ m/s

2×10⁵ m/s

4×10⁷ m/s

5×10⁴ m/s

Solution

Charged particles are undeflected when the electric and magnetic deflecting forces are equal (and opposite in direction).

$$qE = Bqv$$

$$v = \frac{E}{B} = \frac{50000}{0.25} = 2 \cdot 10^5 \frac{m}{s}$$

Answer: 2×10⁵ m/s.