

Answer on Question #47909-Physics-Electromagnetism

How we obtained helical pitches?

Solution

If an electron enters a magnetic field (strength is B) at a given angle θ and velocity v , we can determine the distance between each loop of the helix (pitch).

Pitch means how much linear distance along the axis of the helix traveled in one rotation. It is just the same thing as the pitch of a screw.

The pitch is

$$p = \frac{2\pi m_e v \cos(\theta)}{eB},$$

where m_e is electron's mass and e is electron's charge.