Magnetic field

Space of influence around a magnet

Conclusion of oerested's experiment

Current carrying conductor produces magnetic field around it

Statement of ampere's swimming rule

Deflection of north pole towards left hand of swimmer

Current element in Biot Savart law

Segment of conductor

Statement of biot savart law

Magnetic field at a point is - Directly proportional to + Current in the circuit + Length of current element + Sine of angle between current element and position vector - Inversely proportional to + Square of position

Derivation for expression of biot savart law

- $$dB \alpha I$$
- $$dB \alpha dl$$
- $$dB \alpha \sin\theta$$
- $$dB \alpha \frac{1}{r^2}$$
- $$dB = K \frac{I dl \sin\theta}{r^2}$$

Expression for bio savart law

- $$dB = K\frac{Idl\sin\theta}{r^2}$$

Expression for constant in biot savart law

$$K = \frac{\mu_0}{4\pi}$$

Derivation for expression of biot savart law in vector form

- $$dB = K\frac{Idlr\sin\theta}{r^3}$$
- $$d\vec{B} = K\frac{Id\vec{l}\times\vec{r}}{r^3}$$

Magnitude of constant at biot savart law at free space

$$K = 10^{-7}TmA^{-1}$$

Direction of magnetic field in bio savart law

Perpendicular to the direction of current element and position

List of activities at measurement of direction in biot savart law

- Place right hand screw at current element.
- Rotate towards the position vector.

Angle for maximum magnetic field at biot savart law

90

Angle for minimum magnetic field at biot savart law

0

SI unit of magnetic field

Tesla

One tesla in magnetic field

- 10^7 times magnetic field
- 1 m conducting wire
- 1 A current
- 1 m distance
- Perpendicular