SNS COLLEGE OF ENGINEERING

Kurumbapalayam (Po), Coimbatore – 641 107

An Autonomous Institution

Accredited by NAAC – UGC with 'A' Grade
Approved by AICTE, New Delhi & Affiliated to Anna University, Chennai

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

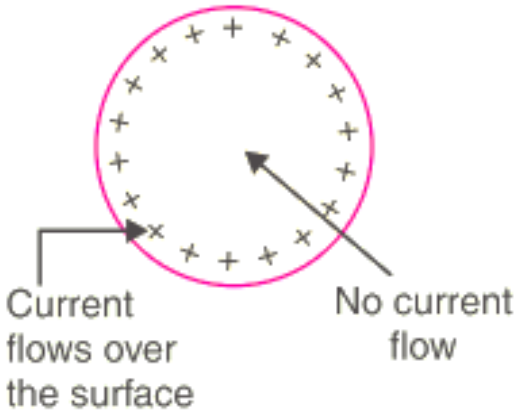
COURSE NAME : 19EE501 TRANSMISSION & DISTRIBUTION

III YEAR /V SEMESTER EEE

Unit 3 – Analysis of Transmission Lines

Skin effect and Proximity effect

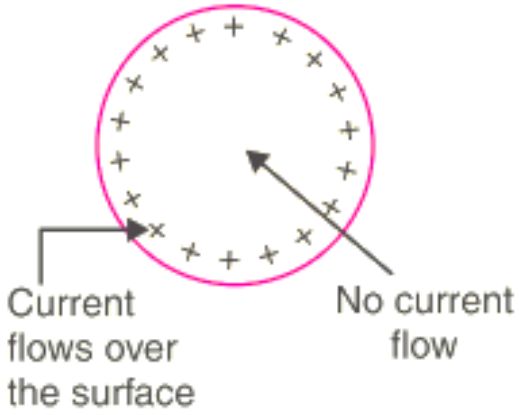
SKIN EFFECT



The tendency of alternating current to concentrate near the surface of a conductor is known as skin effect.

Effects of Skin Effect

Due to skin effect, the effective area of cross-section of the conductor through which current flows is reduced. Consequently, the resistance of the conductor is slightly increased when carrying an alternating current.



FACTORS DEPENDS FOR SKIN EFFECT

The skin effect depends upon the following factors :

(i) Nature of material

(ii) Diameter of wire – increases with the diameter of wire.

(iii) Frequency – increases with the increase in frequency.

(iv) Shape of wire – less for stranded conductor than the solid conductor.

It may be noted that skin effect is negligible when the supply frequency is low (< 50 Hz) and conductor diameter is small (< 1cm).

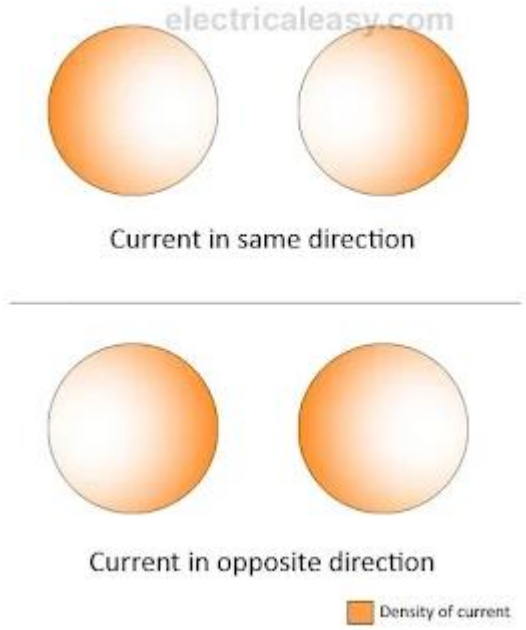
Proximity Effect

When two or more conductors carrying alternating current are close to each other, then distribution of current in each conductor is affected due to the varying magnetic field of each other. The varying magnetic field produced by alternating current induces eddy currents in the adjacent conductors. Due to this, when the nearby conductors carrying current in the same direction, the current is concentrated at the farthest side of the conductors. When the nearby conductors are carrying current in opposite direction to each other, the current is concentrated at the nearest parts of the conductors. This effect is called as Proximity effect.

Impact of Proximity Effect

The proximity effect also increases with increase in the frequency. Effective resistance of the conductor is increased due to the proximity effect.

Skin effect and proximity effect both are absent in case of DC currents, as frequency of DC current is zero.



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THANK YOU