

## Polarization

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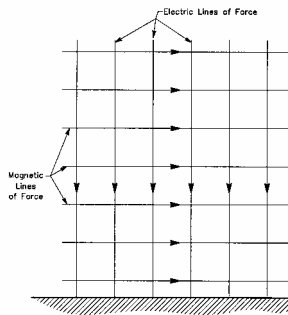
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## Polarization



A wave is said to be polarized in the direction of the electric lines of the force.

In this case the polarization is vertical.

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## Polarization

- If the electric lines do not touch the surface of a perfect conductor perpendicular they will generate infinite current in the conductor.
- The earth ground is a rather good conductor at frequencies below 10 MHz, so waves at these frequencies travelling close to ground are vertically polarized.

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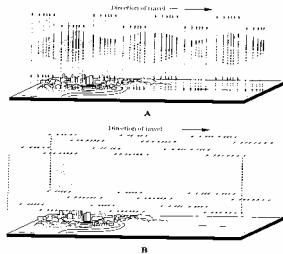
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## Polarization

- If the electric lines of force are horizontal, the wave is said to be horizontally polarized.
- Horizontally and vertically polarized waves is generally classified as linear polarization.
- Linear polarization can be anything between vertical and horizontal.




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## Polarization

- In many cases the polarization of waves is not fixed instead it rotates continuously (somewhat at random).
- A gradual shift in polarization is known as **Faraday rotation**.
- For space communication, **circular polarization** is commonly used to overcome the effect of Faraday rotation.
- A **circular polarized** wave rotates its polarization through  $360^\circ$  as it travels a distance of one wavelength in the propagation media.
- The direction of rotation, as viewed from the antenna defines the direction of rotation – clockwise or counter clockwise

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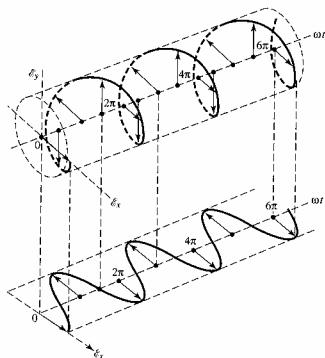
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## Polarization




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