

Antenna and wave propagation question bank with answer

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How is an antenna used for wave propagation? It is usually used with a radio transmitter or radio receiver. In transmission, a radio transmitter supplies an oscillating radio frequency electric current to the antenna's terminals, and the antenna radiates the energy from the current as electromagnetic waves (radio waves).

Which antennas are renowned as patch antennas, especially adopted for space craft applications? 45) Which antennas are renowned as patch antennas especially adopted for space craft applications? ANSWER: Microstrip 46) Which conversion mechanism is performed by parabolic reflector antenna?

Under which conditions of charge does the radiation occur through a wire antenna? If it is a direct medium, and the charge in it is moving according to time it will start producing radiation.

What is the answer to the sky wave propagation? Sky waves are electromagnetic waves transmitting antennae emit and then receive after being reflected by the ionosphere. This method of propagation is known as sky wave propagation. The ionosphere's entire internal reflection of the electromagnetic waves causes the skywaves to propagate.

What types of waves do antennas transmit? An antenna is a specialized transducer that converts electric current into electromagnetic (EM) waves or vice versa. Antennas are used to transmit and receive nonionizing EM fields, which include radio waves, microwaves, infrared radiation (IR) and visible light.

What is the best antenna for ground wave propagation? Accordingly, an antenna that produces vertically polarized radiation (e.g., a vertical monopole) is superior to an antenna that produces horizontally polarized radiation (e.g., a horizontal dipole) if one wishes to optimize ground wave propagation. Figure 1. Radiation emitted from an antenna on the Earth's surface.

What is the most widely used antenna? The ordinary half-wave dipole is probably the most widely used antenna design. This consists of two $\frac{1}{2}$ wavelength elements arranged end-to-end, and lying along essentially the same axis (or collinear), each feeding one side of a two-conductor transmission wire.

What type of antenna is the most focused? High Gain: Parabolic antennas have the highest gain values. That is why they are regularly used to communicate with satellites in outer space. Highly Focused: Thanks to their parabolic reflectors, these antennas are effective in capturing weak signals from distant sources.

What is the best antenna arrangement? The location for the antenna installation should be chosen based on the best unobstructed view of the intended coverage area. This means that the antenna should be at least 12 inches away from any parapet, wall, or obstruction and the ground plane should be 5 to 10 feet above the roofline.

Which antenna emits the radiation pattern? These axially symmetric antennas have radiation patterns with a similar symmetry, called omnidirectional patterns; they radiate equal power in all directions perpendicular to the antenna, with the power varying only with the angle to the axis, dropping off to zero on the antenna's axis.

What is the radiation pattern of a full wave loop antenna? Large loop antennas have a two-lobe radiation pattern at their first, full-wave resonance, peaking in both directions perpendicular to the plane of the loop. Large loops are the most efficient, by an order of magnitude, of all antenna designs of similar size.

How does an antenna convert electrical energy to electromagnetic energy? At the transmitter: The electric current supplied to the antenna makes the electrons vibrate. These vibrations of electrons generate electromagnetic radiation which travels as radio waves. At the receiver: When the waves arrive at the receiver

antenna, they make electrons vibrate inside it.

What is the skip zone on antenna? A skip zone, also called a silent zone or zone of silence, is a region where a radio transmission can not be received. The zone is located between regions both closer and farther from the transmitter where reception is possible.

What is critical frequency in antenna wave propagation? Radio frequency waves propagate between transmitter and receiver using antennas. The radio frequency at or below, the wave gets reflected from ionosphere and above this frequency waves penetrate through ionospheric layer. This frequency is known as critical frequency.

What is skip distance in wave propagation? A skip distance is the distance a radio wave travels, usually including a hop in the ionosphere. A skip distance is a distance on the Earth's surface between the two points where radio waves from a transmitter, refracted downwards by different layers of the ionosphere, fall.

How does an antenna radiate waves? Instead of a loudspeaker, an antenna converts electrical energy (from the modulator) represented by movement of charge carriers in a conductor to electric and magnetic fields (electromagnetic energy). These travel through the air as a radio wave.

What frequency do antennas use? Antennas are commonly used to transmit and receive electromagnetic radiation in the frequency range from 3 kHz to 3 THz.

Is an antenna just a wire? Hobbyist radio kits sometimes include an “antenna” that is nothing more than a wire of appropriate length. This is a good reminder that the most basic antenna is simply a conductor—and that a simple conductor may become an antenna whether we want it to or not.

How far can HF ground wave propagation go? 2.1 HF propagation ground wave: near the ground for short distances, up to 100 km over land and 300 km over sea.

Which is better a 1/4 wave or 5/8 wave antenna? 5/8th wave gain is now 1.95 dB over a 1/4 wave antenna at 2 degrees, but the peak gain is only . 15dB better! The smaller the roof and/or the less centered the antenna, the less gain advantage for a 5/8th wave. This occurs because 5/8th wave antennas develop gain from ground reflections.

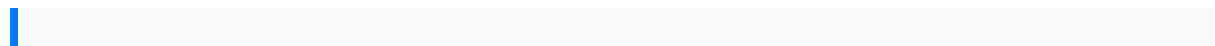
What is the difference between ground and sky wave propagation? These two are the types of radio wave propagation along with ground wave propagation. In sky wave propagation electromagnetic waves were reflected from the ionosphere in the atmosphere. Space wave propagation is transmitted from one antenna to another antenna in the troposphere.

How can the antenna propagate the electromagnetic wave? Antennas radiate (or launch) EM waves. The waves propagate (travel) through space. A way to look at it as follows: As current moves, as is always the case, a magnetic field is created around the conductor and as that charge moves toward one end, an electric field builds up due to more charge being toward one end.

How does an antenna radiate waves? Antenna radiating radio waves: The transmitter applies an alternating current (red arrows) to the rods, which charges them alternately positive and negative, emitting loops of electric field. The arrows of the loops get reversed each time the current changes polarity.

How does an antenna detect electromagnetic waves? Usually an antenna detects either the oscillating electric fields or the oscillating magnetic fields. Remember that the energy in the wave is split equally between these two components of the wave. Antennas are generally either conducting rods or conducting loops.

What is the purpose of the antenna in the transmit process? An antenna is a device that is made out of a conductive, metallic material and has the purpose of transmitting and/or receiving electromagnetic waves, usually radio wave signals. The purpose of transmitting and receiving radio waves is to communicate or broadcast information at the speed of light.



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