

AVN TRAINING PROGRAM 2018

Antenna near field measurement

Objective:

Measure the radiation field in the vicinity of a 12 GHz horn antenna and a 12 GHz DSTV offset paraboloid antenna.

Method:

1. The antennas are mounted on a support frame in an open area and connected to a microwave frequency synthesiser, with a clear line of sight along the line at which measurements will be made. The synthesiser is set to a frequency of 11 GHz and a radiated power output of + 10 dBm
2. A mobile measurement trolley is fitted with a small monitoring antenna and carries a microwave power meter to measure the received signal radiated from the antenna.
3. The measurement trolley is positioned at increasing fixed distances from the radiating antenna and a series of power measurements made with various heights of the monitoring antenna.
4. The received power is measured in decibels relative to 1 milliWatt (10^{-3} Watt).
5. Record the measurements on the form provided.

Analysis of results:

1. Enter the data into a spread sheet using the same format as the data form used in Method section 5.
2. Generate a family of graphs to show how the received power varies as a function of height and distance from the radiating antenna.

Conclusions:

1. What conclusions can be drawn from the results?
2. How does the measured field from the small horn antenna vary? Does it follow the expected inverse square law of distance from the transmitting antenna
3. How does the measured field from the dish antenna vary? Does it follow the expected inverse square law of distance from the transmitting antenna
4. Can you explain the difference between the two sets of measurements
5. Calculate the near field distance for the 26m antenna at wavelengths of 6 cm and 3.5 cm.

Hint: The Near field radiation pattern (the Fresnel zone) extends for D^2/λ , where D is the linear dimension of the antenna aperture.