UWB Comb-Shaped Taper Slot Antennas for Compact Antenna Test Range Application

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ABSTRACT

There are several antenna test ranges. The antenna test ranges are composed of near field range, compact range and far filed range. In the wide band antenna measurement system, different kinds of transmit antennas are required, because the transmitting antennas are almost narrow band. There are several uncertain factors during change the transmitting antennas. In this paper, there are two different kinds of comb-shaped taper slot wideband transmit antennas are developed. These antennas can be applied to different antenna test ranges. This design goal is improvement at low frequency range. The operating bandwidths of two antennas are from 1GHz to 10GHz and 8GHz to 26GHz respectively. These wideband antennas have symmetrical radiation pattern、low directivity and the phase center has not sensitive. The two wideband transmit antennas can applied to ITDAMS (Impulse Time Domain Antenna Measurement System). The commercial 180cm DBS(Direct Broadcast Satellite) reflector combined with the designed comb-shaped taper slot antenna are proposed as the feed to design a compact test range. The combination of the reflector antenna and the ITDAMS is used to the CATR(Compact Antenna Test Range). Due to the edge diffraction fields of reflector can be gated out by the ITDAMS. The comb-shaped taper slot antenna is located at the focus of the prime feed reflector .The feed spillover and edge diffraction can be easily gated out. The quiet zone performance of CATR is evaluated and measured at 1, 4, 7, 10GHz. For being comparison and identification of antenna radiation pattern, putting the quantity which do characteristic at the near field range and compact antenna test range respectively.

Keywords : ITDAMS ; compact antenna test range ; comb-shaped taper slot antenna

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