ABSTRACT

There are several antenna test ranges. The antenna test ranges are composed of near field range, compact range and far field 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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Micro-strip spiral antennas provide a low-cost alternative to UWB horn antennas, but common spiral designs demonstrate poor pulse dispersion performance. The article “Low-Dispersion Spiral Antennas” proposes using combination spirals, which combine the performance of multiple simple spiral antennas. Bottom: Array mounted to an SUV for system testing. The primary application of this radar system is ground-penetration imaging to detect buried objects, specifically improvised explosive devices (IEDs) [4]. From an antenna design perspective, the important term here is “improvised”; these devices can be almost any shape and size. However, this antenna design is linearly polarized and has manufacturing issues that limit its potential in portable radar applications. Compact antennas for UWB applications. Taeyoung Yang, Seong-Youp Suh, Randall Nealy, William A. Davis, and Warren L. Stutzman Virginia Tech Antenna Group, Bradley Dept. of Elec. & Comp. Engineering Virginia Tech, Blacksburg, VA 24061-0111. Designing the UWB antenna can be one of the most challenging of these issues. II. MEASUREMENT SETUP All antenna tests were performed using two identical antennas with an HP 8510 network analyzer [5] in both the time and frequency domains in the Virginia Tech Antenna Group (VTAG) anechoic chamber. The antennas were oriented in a co-polarized manner and separated by 40 cm distance to be in the far field. The antenna configuration is based on a combination of two crossed exponentially tapered slots plus a star-shaped slot printed on both sides of a 10-mils dielectric substrate. The band rejection is obtained with the addition of extra slots at the antenna back-face metallization. The radiation pattern and polarization are very stable over the entire UWB. Link measurements between two identical antennas demonstrate low pulse distortion over almost all the solid angle. Ultrawideband (UWB) radio is an emerging and promising technology for short-range applications enabling extremely high data rate. This technology transmits very low-energy-level broadband pulses.