

Large Ultra Wideband Antenna Arrays for High Power Electromagnetic Systems

Jürgen Schmitz, Bernd Schünemann, Markus Jung, and Gerhard
Wollmann

Rheinmetall Waffe Munition GmbH, Heinrich-Erhardt-Straße 2, 29345
Unterlüß, Germany

Antenna arrays, which contain several modular and independently controlled systems, are a feasible system configuration to transfer signals over long distances. The contribution deals with the characterisation of ultra wideband antenna arrays and the ability to integrate them into mobile systems. A novel approach is developed which determines time domain amplitude based antenna patterns of large arrays containing an arbitrary amount of equidistant positioned antenna elements. For this purpose, the transient electrical farfield of a single antenna in spherical coordinates at different positions have to be measured or simulated.

Several array configurations with up to four TEM horn antennas are fed by RHL pulse generators and the chosen antenna patterns are measured after successful synchronisation. These patterns show good agreement with patterns which are calculated using a single element. High directivity is achieved up to 23 dBi.

In addition, alternative wideband antennas and the according arrays are presented. These antennas have minimised dimensions in order to integrate them in mobile systems, like cars, etc. All these antennas are investigated for the operation as "phased" or "scanning" array.