

LTE-based passive bistatic radar system for detection of ground-moving targets

ABSTRACT

Use of a passive bistatic radar (PBR) system in the surveillance or monitoring of an area has its advantages. For example, a PBR system is able to utilize any available signal of opportunity (for example, broadcasting, communication, or radio navigation signals) for the purposes of surveillance. With this in mind, there are potentially many research areas to be explored; in particular, the capability of signals from existing and future communication systems, such as 4G and 5G. Long-Term Evolution (LTE) is the world's most current communication system. Given this fact, this paper presents the latest feasibility studies and experimental results from using LTE signals in PBR applications. Details are provided about aspects such as signal characteristics, experimental configurations, and SNR studies. Six experimental scenarios are carried out to investigate the detection performance of our proposed system on ground-moving targets. The ability to detect is demonstrated through use of the cross-ambiguity function. The detection results suggest that LTE signals are suitable as a source signal for PBR.

Keyword: Passive bistatic radar system; LTE; Ground-moving target detection