

RCS classification on ground moving target using LTE passive bistatic radar

ABSTRACT

Detection and location on the ground moving target are a function of dependent bistatic Radar Cross Section (RCS) and radar design parameters which in this experimental study used LTE signal as a source for passive bistatic radar (PBR). Ground moving target also can be classified in dimensions using conventional processing approaches which we performed a simulation using Computer Simulation Technology (CST) Microwave studio. The target bistatic radar cross-section will give a realistic calculation on PBR performance with the requirement of complete treatment. Three models of ground moving target are designed using Autodesk software which the models are classified as compact car, saloon car and sport utility vehicle (SUV) for size of small and medium and large respectively. The designs are for observation on the performance of RCS using a bistatic area between transmitter and receiver with the frequency transmit signal from long-term evolution (LTE) based station is 2.6 GHz and with far-field conditions. The simulation results show that largest area of ground moving target, SUV had better outcome compared to other ground moving target which reliable with Babinet's principle, which declares a target of physical cross-sectional area is proportionate to RCS. Different cross-sectional area of transmitting signal from other ground moving target give smaller RCS which cause from the reduction area of reflected signal such as compact car according to small size and saloon car according to medium size. This might improve the sensitivity of LTE passive bistatic radar if using greater size of ground moving target for a better RCS performance.

Keyword: RCS; Ground moving target; CST; LTE; Passive bistatic radar