ANALYSIS ON THE DIFFERENT TARGETS AND BI-STATIC ANGLES TO THE RADAR CROSS SECTION USING LTE FREQUENCY

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ABSTRACT

This paper presents on the analysis of the effect of different targets and bi-static angles to the radar cross section (RCS) using Long Term Evolution (LTE) frequency. The targets used in this project are Toyota Rush and Proton Exora. The modelings of cars are designed using Autodesk 3Ds Max and then export to CST Microwave Studio in order to simulate the radar cross section. Analyses of simulation of a target with different bi-static angles and different cars in backscatter radar are conducted for 59 and 90 degree plane wave propagation. Dimensions used for designing the car are based on the actual car whereas the material used for the car is perfect electrical conductor (PEC). It is observed that the readings of RCS are different depends on the shape and size of car. The different angles of plane wave give different readings of RCS.

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CHAPTER 1

INTRODUCTION

1.0 BACKGROUND OF STUDY

Communication waveform has potential for passive and active radar applications. In this modern technology, radar applications are necessary for many countries for the national security. Radar applications basically use for detection or tracking the target either ground or air target. Theoretically, active radar is different with passive radar. Active radar is a radio wave that emitted from an antenna and reflects off objects the wave encounters. The signal is reflected back to the emitter location, where a receiving antenna picks up the echoed signal. When the transmitter and the receiver of a radar system are collocated, the radar is said to be mono-static. [4] Different with active radar, passive radar is a systems that detect and track objects by processing reflections from non-cooperative sources of illumination in the environment, such as commercial broadcast and communications signals.[14]

In recent years, the use of illuminators of opportunity by passive radar systems have been employed in such things such as television[5], FM radio[6], digital video broadcasting (DVB)[7], digital audio broadcasting (DAB)[7], satellites[8], wireless fidelity (Wi-Fi)[9], global systems for mobile communications (GSM) in cellular phones[10] and worldwide interoperability for microwave access (WiMAX). [11]