THE EFFECT OF DIFFERENT CROSSING ANGLES TO THE RADAR CROSS SECTION (RCS) OF THE TARGET IN FSR

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ABSTRACT

This paper presents on the analysis of the effect of different crossing angles to target's radar cross section (RCS) The target used is in this research is a BMW X6 model. The model of car designed using Autodesk 3DS Max and then export to CST Microwave Studio in order to simulate the RCS. The frequencies used for this simulation were based on UHF and VHF. Based on the simulation result, it is shown that the 400MHz of frequency and 90 degree angles of incident plane wave are the best position to define the maximum tracking and more information of RCS can be obtained.

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CHAPTER 1

INTRODUCTION

1.1 BACKGROUND OF STUDY

Forward Scattering Radar has been investigated over years mainly for air target detection and tracking [1]. Recently a micro FS radar network for ground target (vehicles and humans) detection has been developed [2]. FSR has a number of unique characteristics that make it interesting including the enhancement of the target radar cross section (RCS) relative to traditional monostatic radar, which improves the sensitivity of the radar system itself. The FSR effect gives some advantages in increasing target radar cross sections (RCS) for targets with dimensions bigger than the radar wavelength[3].The network includes four major segments: forward scatter radar that provides the tar-get sensing capability (i.e., detection and parameters estimation); inter-nodes communication to transfer data within the net-work; navigation which operates at the initial stage to register node positions, and finally global communication for data ex-change between the network and the command centre[4].

UHF and VHF propagation characteristics are ideal for short-distance terrestrial communication, with a range generally somewhat farther than line-of-sight from the transmitter [5]. Using these lower frequencies it is easier to obtain high-power transmitters. The attenuation of the electro-magnetic waves is lower than using higher