ANALYSIS OF TARGET RADAR CROSS SECTION (RCS) USING COMPUTER SIMULATION TECHNOLOGY (CST) SOFTWARE

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Abstract

This paper describes about the design and analysis target radar cross-sectional (RCS) for radar system topology using Computer Simulation Technology (CST MWS) Software. Simulation of the target radar is done in order to demonstrate the radar cross sectional and farfield simulation. The result consists of comparison between target radar cross-sectional for different selected targets angle position and specific frequency of a same car, and RCS for different cars model. The simulation process was done using transient solver from the software application. This simulation process will be the input of the prediction of the performance of forward scatter radar (FSR).

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Chapter 1

Introduction

1.1 Background of Study

Forward scatter radar network (FSR), is a special type of bistatic radar, where the target is close to the transmitter-receiver baseline that corresponds to the case when the bistatic angle, β is close to 180° [1]. When the bistatic angle is equal or close to 180°, the radar system is referred to FSR system. In FSR network, the presence of a target will partly block the signal wave front from the transmitter. This blocking yields a hole in the wave front, known as the target shadow where the shadow is actually an EM field being scattered by the target.

One of the factors which affecting the target signature or signal is the radar cross-sectional (RCS) where the RCS is highly depending on target's silhouette and frequency. Hence the changes in target's trajectories will affect the received signal.

The aim of these studies is to analyze the target RCS using CST software base on the selected design car using simulation method. This CST MWS software is simulation software where it simulates selected design based on user application. By using CST MWS software, a target model RCS has been developed using the three dimension (3D) application tool to analysis and obtain the farfield simulation on different target angles of RCS, frequencies and types of car. This result will be an input to predict the performance of FSR.