ANALYSIS OF TARGET RADAR CROSS-SECTION USING GST SOFTWARE

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ABSTRACT

This paper presents the analysis of car modeling designed by using CST software with the concept of forward-scatter radar (FSR) which exploits the enhanced bistatic radar cross-section of a target in the forward direction. FSR has the potential to reliably detect and track vehicles with high sensitivity. FSR offers interesting feature such as an enhanced target radar cross section compared to traditional radar. A method to obtain 3-dimensional Computer-Aided Design (CAD) models is presented. The effects of radiation pattern on radar cross-section from the modeling are presented. The differences of RCS for different angles and frequencies are analyzed. The comparison of forward-scatter and back-scatter are being discussed.

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CHAPTER 1

INTRODUCTION

1.1 INTRODUCTION

1.1.1 BACKGROUND OF STUDY

Forward scattering radar (FSR) is a special mode of bistatic radar where the bistatic angle is nearly $180°$. FSR has a number of unique characteristics including the enhancement of the target radar cross section (RCS) relative to traditional monostatic radar, which improves the sensitivity of the radar system itself. Theoretically, the forward scattering RCS mainly depends on the physical cross section of the target radar and the wavelength used, and is independent of the surface shape of the target and any radar absorbing material (RAM) coating, which reduces the target's RCS in the case of traditional radar. This feature makes the FSR system robust against stealth technology. These advantageous features have created interest in FSR, which is believed was abandoned after World War II. Currently, only a few researchers and research laboratories are seriously working in this area. FSR receiver can utilize radiation from non-cooperative transmitter without revealing its location. In a hostile environment, this is highly desirable as the receiver may be used covertly [4]. That is why it is important to improve the capability of the radar.