ANALYSIS OF CONCENTRIC BRIDGE RING CIRCULAR AND SQUARE ELEMENT FOR REFLECTARRAY ANTENNA.

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ABSTRACT

This paper presents a study of phase slope, phase range and return loss for concentric bridge ring circular and square element for reflectarray antenna by using single layer of substrate. The study has been done to find the best dimensions that suit the reflectarray antenna criteria for both elements. Comparison of simulated results shows that concentric bridge ring circular element performs a better performance compare with concentric bridge ring square element that can be covered two frequency operation. All the process and development is done using CST MWS.

CONTENTS

CHAPTER 1

INTRODUCTION

1.0 Background of Study

Recently, reflectarray antenna has been studied to replace the conventional parabolic antenna for satellite applications due to its light weight and smaller size compared to the conventional parabolic antenna. Reflectarray antenna having combined features of the microstrip array antenna and traditional parabolic antenna. Reflectarray antenna using printed microstrip element having characteristic of low profile, lighter and cheaper [10,21]. Microstrip reflectarray consists of very thin, flat or slightly reflecting surface and illuminating feed. On the reflecting surface there are many of reflecting element without any feeding power as shown in figure 1.0. The reflecting element is normally copper with various of shape, but normally simple geometry that will simplify the analysis process. The radiating elements will reradiate and scatter the incident field with angle phases that are required to form a planar phase form.

The main disadvantages of printed microstrip reflectarray is narrow bandwidth of the microstrip patch elements on the reflectarray surface and it also having the different spatial phase delays from the feed to the reflecting elements [10,21]. There are several methods has been reported to achieve planar phase front as shown in figure 1.1. Using identical patch elements with different length of stubs (variable length phase delay lines