

Reconfigurable Beamscanning Sinusoidally Modulated Reactance Surface Antenna with Period and Surface Reactance Control

Doohyun Yang^o and Sangwook Nam
 INMC, School of Electrical Engineering, Seoul National University
 doohuyn@ael.snu.ac.kr

I. Introduction

Microstrip leaky wave antennas have been widely used for many areas due to its high directivity and low profile features. SMRS (Sinusoidally Modulated Reactance Surface) antenna is one of the leaky wave antenna and its surface reactance is periodically modulated so that its -1st floquet harmonic radiates. In this paper, we propose a reconfigurable beamscanning SMRS antenna using varactor components with period and surface reactance control.

II. Antenna Model and Results

Figure 1 shows the part of the proposed antenna which is composed of microstrip corrugated structure whose end of stub is connected with via and varactors are mounted at the middle of the stub so that can control the surface reactance of each unit cell.

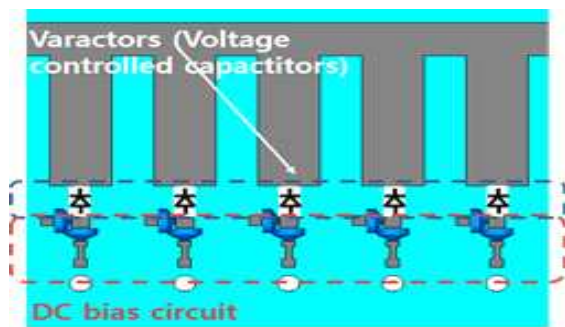


Figure 1. Unit period structure of the proposed antenna

With this proposed antenna structure, radiation angle was controlled by adjusting the period and surface reactance of the reconfigurable SMRS antenna.

Based on the described beamscanning scheme of the proposed antenna, we have designed a reconfigurable beamscanning SMRS antenna and simulated with 3D EM simulator and its radiation patterns with different modes were plotted in Figure 2. The result shows -45 to 45 degree of beamscanning range was obtained.

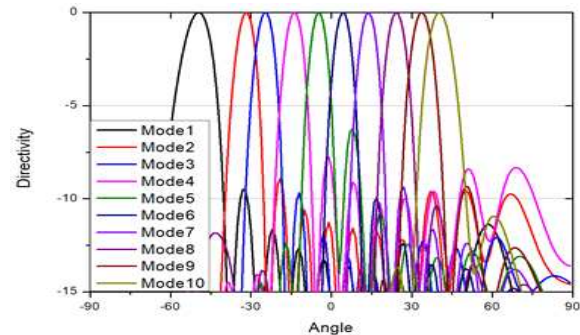


Figure 2 Radiation pattern of the proposed antenna with different radiation modes at fixed frequency (5.8 GHz)

III. Conclusion

We proposed a reconfigurable beamscanning antenna using varactor with the period and surface reactance control. From -45 to 45 degree of beamscanning range was obtained with 16 dBi of directivity at 5.8 GHz.

Acknowledgement

This work was supported by the Center for Advanced Meta-Material (CAMP) funded by the Ministry of Science, ICT, and Future Planning under Global Frontier Project CAMP-2014M3A6B3063708

References

- [1] A. A. Oliner and A. Hessel, "Guided waves on sinusoidally-modulated reactance surfaces," *IRE Trans. Antennas Propag.*, vol. 7, pp. 201-208, Dec. 1959.