The reflectarray is an antenna with a reflecting surface consisting of hundreds of elements on its aperture where the elements are designed to incident field with certain phase shift in order to collimate the beam in the desired direction. Reflectarray acts as a parabolic antenna.

Reflectarray Antenna vs. Parabolic Antenna

- Parabolic antennas are too large and heavy due to their curved reflecting surfaces but reflectarrays are lightweight, simple manufacturing, low profile and low cost. Besides, reflectarray antennas have lower gain according to parabolic antennas.

Theoretical Calculations and Design of Reflectarray

- Variable height dielectric elements are used in the reflectarray designs to beam steering. The height of each element is determined according to required phase shift and the reflection phase curve.
- The dielectric reflectarray has a square aperture with a side length of 19.5 cm and 13x13 = 169 variable height dielectric elements.

Acknowledgements

- This project was completed within the context of ELE 401-402 Graduation Project courses in Hacettepe University, Faculty of Engineering, Department of Electrical-Electronics Engineering.
- I thank Prof. Dr. Birsen SAKA TANATAR and Dr. Noaman NASEER for their supports and helping.