

Seminar on

Design of Reflectarrays

by

Prof. Trevor S. Bird

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Date : 20 April 2016 (Wednesday)
Time : 11:00 am – 12:00 noon
Venue : Room 15-202, 15/F, meeting room of State Key Laboratory of Millimeter Waves, 15/F, Academic 3, City University of Hong Kong

Abstract

An alternative form of aperture antenna that has become practical in recent years is the reflectarray. This type of antenna brings together the advantages of both reflectors and patch arrays for producing single or multiple beams. In this talk, a simple but accurate theory of the reflectarray is described [1]. Extensions are given to other forms of reflectarrays including single and offset-fed versions.

As a recent example, an offset-fed reflectarray that can radiate linear or circular polarization for multi-polarization applications is outlined [2]. The reflectarray surface consists of two double-layer dipole arrays that are orthogonally printed on both sides of the dielectric substrate. With a linearly-polarized (LP) feeder, the antenna can transform the LP incident wave into a circularly-polarized (CP) one. Both LHCP and RHCP waves can be obtained by rotating a LP feeder about its axis so that its polarization lies in the intercardinal plane of the elements. The method has been tested with a 32×32-element prototype, which was designed and fabricated (Fig. 1). The measurements validate the simulation results.

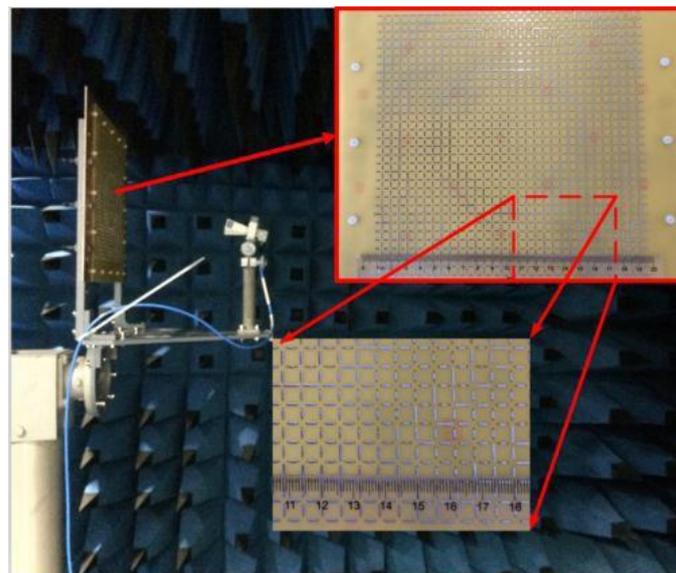


Figure 1: 32x32 element prototype offset reflectarray under test [2].

[1] T.S. Bird, "Fundamentals of aperture antennas and arrays: From theory to design, fabrication and testing", Chap. 9, John Wiley & Sons, Ltd, 2016.



[2] Y.Y. Chen, Y. Ge & T.S. Bird, "An offset reflectarray antenna for multi-polarization applications", IEEE Antennas & Wireless Propagat. Lett., Vol. 15, 2016.

Biography

Trevor Bird graduated with a PhD from the University of Melbourne in 1977. Afterwards he worked in the UK and returned to Australia to lecture at James Cook University of North Queensland before joining CSIRO in 1983. He held several senior positions in CSIRO and was Chief Scientist of the CSIRO ICT Centre from 2004 to 2011. Currently he is Principal of Antengenuity a specialised consultancy firm, an Adjunct Professor at Macquarie University, and a CSIRO Honorary Fellow.

He has published over 300 papers, 1 book, 10 book chapters, and he holds 12 patents. He is a Fellow of four learned societies, including IEEE, is an Honorary Fellow of the Institution of Engineers, Australia, and is a Fellow of the Australian Academy of Technological Sciences and Engineering.

Dr Bird has been awarded three CSIRO Medals, an IEEE Third Millennium Medal, a Centenary Medal for service to Australian society in telecommunications, five best paper awards, was named 2003 Professional Engineer of the Year by the Sydney Division of Engineers Australia and in 2012 he received the M.A. Sargeant Medal for 2012 from Engineers Australia for achievement in the field of electrical engineering.

He was made a CSIRO Fellow in 2007 and in 2010 he completed six years as Editor-in-Chief of the IEEE Transactions on Antennas & Propagation. In 2013 he was President of the IEEE Antennas & Propagation Society.

*** ALL ARE WELCOME ***

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