香港城市大學 City University of Hong Kong

Department of Electronic Engineering

State Key Laboratory of Millimeter Waves 毫米波國家重點實驗室（香港）

IEEE (HK) Section AP/MTT

Seminar on

High gain and high efficiency planar waveguide arrays

by

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Abstract

Design of high gain and high efficiency antennas is one of the key challenges in antenna engineering and especially in communication systems using micro- and millimeter-waves. Various types of planar waveguide arrays with series-fed traveling wave operation have been developed in Tokyo Tech with the special focus upon efficiency enhancement as well as reduction of fabrication cost. In this review, four kinds of single layer waveguide arrays characterized with the series fed travelling wave operation are surveyed first. To cope with the bandwidth narrowing effects due to long line effects associated with the series fed operation, authors have introduced partially corporate feed embedded in the single layer waveguide. They further extended the study to cover fully corporate feed arrays with multiple layer waveguide as well; a new fabrication technique of diffusion bonding of laminated thin plates has the potential to realize the low cost mass production of multi-layer structures for the millimeter wave application.

Secondly, the novel methods for loss evaluation of copper plate substrate are established for the design of post-wall waveguide arrays where dielectric loss and conductor loss is determined in wide range of millimeter wave band, by using the Whispering gallery mode resonator. This enables us to design the planar arrays with the loss taken into account.

Biography

Makoto Ando (SM'01–F'03) received the D.E. degrees in electrical engineering from Tokyo Institute of Technology, Tokyo, Japan in 1979. From 1979 to 1983, he worked at Yokosuka Electrical Communication Laboratory, NTT, and was engaged in development of antennas for satellite communication. He moved to Tokyo Institute of Technology in 1983 and is currently a Professor. His main interests have been high frequency diffraction theory such as Physical Optics and Geometrical Theory of Diffraction. His research also covers the design of waveguide planar arrays and millimeter-wave antennas. He received the Achievement Award and the Paper Awards from IEICE Japan in 1993 and 2009. He also received the 8th Inoue Prize for Science in 1992, the Meritorious Award of the Minister of Internal Affairs and Communications and the Chairman of the Broad of ARIB in 2004 and the Award in Information Promotion Month 2006, the Minister of Internal Affairs and Communications. He served as the guest editor-in-chief of more than six special issues in IEICE, Radio Science and IEEE AP. He was the general chair of the 2004 URSI EMT symposium in Pisa and of the ISAP 2007 in Niigata. He served as the member of Scientific Council for Antenna Centre of Excellence - ACE in EU's 6'th framework programme since 2004. He served as the Chair of Commission B of URSI 2002-2005. He was the 2007 President of Electronics Society IEICE, the 2009 President of IEEE Antennas and Propagation Society and is currently the vice-president of URSI. He is the Fellow IEEE and IEICE.

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***** ALL ARE WELCOME *****

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