Directive Planar Antennas Based on Leaky Waves

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Leaky-wave antennas (LWAs) use a traveling wave to radiate continuously along a structure in order to produce a focused beam of radiation. Planar LWAs are particularly attractive since they are low prolife and easy to manufacture. This talk will overview two types of planar LWAs and discuss recent advances in both areas.

The first type of planar leaky-wave antenna is the one-dimensional printed periodic LWA. One of the main challenges has been to design such structures to allow scanning through broadside, and an overview of different strategies for doing this will be summarized, including both metamaterial and other novel approaches.

The second type of planar structure that will be discussed in the resonant Fabry-Pérot cavity antenna. This structure uses a resonance between a ground plane (or other reactive surface) and a partially reflective surface such as a periodic FSS. Much insight into the operation can be obtained by treating this structure as a leaky-wave antenna, in which case a narrow beam is formed by virtue of a cylindrical (two-dimensional) leaky wave that propagates outward from the exciting source.

Finally, the interesting optical phenomenon of directive beaming will be mentioned, and this will be related to leaky-wave propagation.

Biography – David R. Jackson

David R. Jackson was born in St. Louis, MO on March 28, 1957. He obtained the B.S.E.E. and M.S.E.E. degrees from the University of Missouri, Columbia, in 1979 and 1981, respectively, and the Ph.D. degree in electrical engineering from the University of California, Los Angeles, in 1985. From 1985 to 1991 he

was an Assistant Professor in the Department of Electrical and Computer Engineering at the University of Houston, Houston, TX. From 1991 to 1998 he was an Associate Professor in the same department, and since 1998 he has been a Professor in this department. His present research interests include microstrip antennas and circuits, leaky-wave antennas, leakage and radiation effects in microwave integrated circuits, periodic structures, and electromagnetic compatibility and interference.

He is a Fellow of the IEEE and is presently serving as the chair of the Distinguished Lecturer Committee of the IEEE AP-S Society, and as the Secretary of USNC (the U.S. National Committee of URSI, the International Union of Radio Science). He is also on the Editorial Board for the IEEE Transactions on Microwave Theory and Techniques.

Previously, he has been the chair of the Transnational Committee for the IEEE AP-S Society, the Chapter Activities Coordinator for the AP-S Society, a Distinguished Lecturer for the AP-S Society, a member of the AdCom for the AP-S Society, and an Associate Editor for the IEEE Transactions on Antennas and Propagation. He previously served as the chair of the MTT-15 (Microwave Field Theory) Technical Committee. He has also served as the chair of Commission B of USNC-URSI and as the secretary of this commission. He also previously served as an Associate Editor for the Journal Radio Science and the International Journal of RF and Microwave Computer-Aided Engineering.