SESSION 2: FIELD THEORY OF GUIDING STRUCTURES

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This session and the companion session on Component Applications of Field Theory evolved from the review of some 50 papers by the Field Theory Subcommittee of the 1984 MTT-S Technical Program Committee. The process began with the selection of papers which the Subcommittee felt were indeed field theoretic in nature and which treated topics of current interest. These papers were then further screened to determine which were more suitable for Open Forum presentation and which could be grouped to develop sessions with some coherence of theme. After long hours of review and debate and many difficult decisions, we organized this year's sessions on Field Theory of Guiding Structures and Component Applications of Field Theory.

Field Theory of Guiding Structures includes papers covering a variety of topics which should be of interest to those individuals concerned with the solution of guided wave problems. Three of the papers deal with planar structures. Paper 1 shows that LSE and LSM modes can be independently excited in planar structures and discusses the advantages of this decoupling in the analysis of such structures. Paper 4 reports an efficient technique for treating higher order modes in stripline. The very general problem of propagation along planar structures with complex, layered, anisotropic media is treated in paper 3. The formulation should permit further extension of the spectral domain technique which has been proven a powerful and versatile method of analysis for a variety of structures. The remaining two papers address the use of equivalent networks. Paper 2 uses this approach to derive a simple, closed form expression for the dominant mode characteristics of groove guide while paper 5 presents an extension of the TLM concept to three dimensions. Overall, the papers reflect a continuing trend toward the numerical solution of field problems and where possible the use of equivalent circuits and simplified expressions to achieve greater computational efficiency.

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