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Feed line losses in microstrip antenna arrays.

G.S. Kirov, L.P. Kamburov and H.D. Hristov 1

An effect of the number of antenna array elements and element spacing on microstrip feed line losses is studied. The effect of substrate parameters of the microstrip feed line is also included in this investigation. The research is carried out in Ku-band.

Orthosynthesis: on the beamforming from a set of uniform linear arrays by the orthogonal method.

H. Margaritis, S. Goudos, G. S. Miaris, T. Samaras and J. N. Sahalos 9

A method of beamforming of uniform linear arrays by using the orthogonalization technique is presented. A set of composing functions similar to that used by Woodward – Lawson is overlapped. In our study, instead of sampling of the desired pattern, the orthogonal method is applied. Depending on the form of the pattern, the number of the composing functions may be the same or different than the elements of the array. Also the progressive phase of each function can be derived in several ways. A set of numerical examples for different array patterns will be presented and will show the usefulness of the method.

Hybrid Galerkin-Rayleigh method: a unique solution for E-scattering from 2-d roughness on a pec ground plane.

A.G.Tyzhnenko 23

A unique solution for scattering from a roughness (boss or indentation) on a PEC ground plane is obtained making use of a new method that combines the Galerkin MoM on entire-domain basis and the Rayleigh's method expansion of a solution in terms of the eigensolutions of Helmholtz equation in cylindrical coordinates. This method uses the dividing of upper space into two parts with the aid of semi-circumference that encloses the roughness. Numerical calculations are enacted on the roughness surface only and hence give a solution in a very economical way for any grazing. Uniqueness of a solution is proved and demonstrated. The two-dimensional case is considered. However, this method is applicable for the tree-dimensional scalar case as well.

Peculiarities of the magnetization behavior in thin films with uniaxial anisotropy

B. Petkov and L. Vatzkitchev **39**

A study about qualitative physical behavior of the magnetization in thin one-domain films, with uniaxial anisotropy in the film plane is made. Being based on the Stoner–Wohlfarth model it determines peculiarities of the magnetization behavior by means of analytic techniques. A benefit of the method is avoiding the necessity to find the explicit solutions of the Stoner–Wohlfarth equations, which is rather cumbrous. Similar attempts might be of use for other convenient expressions, like Taylor expansions and determination of singularities in situations more complicated than one domain model.

Convergent Galerkin Mom solver to the EFIE for 2-d smooth screens.

A. G. Tyzhnenko **45**

The convergence of the Galerkin method of moments (GMoM) is proved in the familiar Hilbert space L_2 *for the electric field integral equation (EFIE) solver for two-dimensional smooth screens. Completeness of the orthogonal basis functions used permits one to obtain an exact relationship between residual and actual errors. A Fredholm MoM equation is obtained making use of a regularization procedure applied to the traditional MoM equation in the space of sequences. This issue permits one to increase substantially the accuracy of this new GMoM compared to the traditional one, and consider the adequacy problem for the traditional GMoM.*