

2011

Efficient Full Wave 3D EM Modeling of Large Phased Arrays (by WIPL-D Software)

Kolundzija, B.M., Olcan, D.I., Zoric, D.P., Stevanetic, S.S., "Efficient full wave 3D EM modeling of large phased arrays (by WIPL-D software)", 2011 IEEE International Symposium on Antennas and Propagation and USNC/URSI National Radio Science Meeting (AP-S 2011), July 3-8, 2011, Spokane, Washington, USA, pp. 2732-2735, ISSN: 1522-3965, DOI: 10.1109/APS.2011.5997090

[Link to Publication](#)

Abstract: The paper presents efficient technique for full wave 3D EM modeling of electrically large arrays. Basically it consists in two steps: 1) the network parameters (Y,Z,S) of the array are calculated together with its radiation patterns when each of the elements is active, while all other elements are short-circuited; 2) radiation patterns are obtained by arbitrary combinations of feeding voltages by post-processing data from the first step. 3D EM modeling is facilitated decomposing the problem having geometrical symmetry and asymmetrical excitation into four fully symmetrical problems of quarter size. Matrix solution is accelerated using graphical processor unit (GPU). Thus, array problems of 400 and 900 microstrip patch antennas become doable in 6 hours and 1 day, respectively.

Emulation of Gain Measurements of Standard Gain Pyramidal Horns using 3D EM Solver

Pavlovic, M.S., Kolundzija, B.M., "Emulation of Gain Measurements of Standard Gain Pyramidal Horns using 3D EM Solver", 2011 IEEE International Symposium on Antennas and Propagation and USNC/URSI National Radio Science Meeting (AP-S 2011), July 3-8, 2011, Spokane, Washington, USA, pp. 1906 - 1909, ISSN: 1522-3965

[Link to Publication](#)

Abstract: Pyramidal horn antennas are mostly used as "known gain" antennas in measurements of antennas with gain to be determined. Manufacturers of antennas, institutions for standardization and measurement laboratories offer tabulated data for antenna gain to be used in measurements with defined accuracy (typically 0.5 dB, 0.25 dB). There has been continuous effort to achieve a better accuracy in measuring antenna gain. The ultimate goal is to have accuracy of 0.1 dB for SGH. In this paper two most commonly measurement techniques are efficiently emulated using commercial full wave EM solver in order to explore possible causes for measurement errors. It was shown that, when ideally applied, these two measurement techniques give almost exactly the same results for gain as direct full wave solution.

Full Wave Analysis of Periodic and Random Surface Distortions on Reflector Antennas

Pavlovic, M.S., Milosevic, T.S., Kolundzija, B.M., "Full Wave Analysis of Periodic and Random Surface Distortions on Reflector Antennas", 2011 IEEE International Symposium on Antennas and Propagation and

USNC/URSI National Radio Science Meeting (AP-S 2011), July 3-8, 2011, Spokane, Washington, USA, pp. 956 - 959, ISSN: 1522-3965

[Link to Publication](#)

Abstract: The focus of this paper is to present full wave analysis of periodic and random surface distortions on reflector antennas. Three models of distortions are used - random distortion, one dimensional cosine and two dimension cosine distortion. Also, in order to compare results, reflector with ideally flat surface was used as referent model. In this paper, the distorted reflector surface points are approximated by summing two components: an undistorted (ideal) surface component and a surface error component. For each case, radiation patterns of the reflector are simulated and influence to main lobe and grating lobe is observed for reflector antennas up to 200 wavelengths in diameter by using an efficient MoM 3D solver.

Efficient Full Wave Analysis of Eclectically Large Multilayered Radomes

Mrdakovic, B.LJ., Kolundzija, B.M., "Efficient Full Wave Analysis of Eclectically Large Multilayered Radomes", Proc. of 3rd International IEEE Conference on Microwaves, Communications, Antennas and Electronic Systems, IEEE COMCAS 2011, Tel Aviv, Israel September 7-9, 2011, ISBN: 978-1-4577-1692-8, DOI: 10.1109/COMCAS.2011.6105938

[Link to Publication](#)

Abstract: The paper presents efficient full wave analysis of electrically large multilayered radomes, which are based on advanced MoM techniques: 1) higher order basis functions, 2) "smart reduction" of expansion orders, 3) excitation of structure by field generators, 4) equidistant positioning of dielectric surfaces based on equal meshing of all layers, 5) direct solution of matrix equation based on LU decomposition, 6) out-of-core matrix solver, and 7) CPU and GPU parallelization. Results for A-sandwich radome of 8λ in diameter, which are obtained in 7 minutes at PC, are shown for different beam steering angles. Two different A-sandwich radomes with 16λ in diameter are shown in order to illustrate influence of the middle layer thickness on the radiation pattern. Finally, the radiation pattern of the array with a radome which diameter is equal to 60λ is shown.

2010

Influence of Detection Zone Length on Space Coverage in a Far Field UHF RFID System

Mrdakovic, B.LJ., Kolundzija, B.M., "Influence of Detection Zone Length on Space Coverage in a Far Field UHF RFID System", IEEE Antennas and Propagation Society International Symposium, APS/URSI '10, Toronto, Ontario, Canada, July 11- July 27, 2010.

[Link to Publication](#)

Abstract: Absolute coverage is ultimate requirement for many modern RFID systems. Limiting of detection zone and appropriate choice of tags are some of the crucial issues in creating of such system. In this paper we analyzed an RFID system with circularly polarized reader antenna, where objects (with tags) are collected through a gateway and can be detected in any position in detection zone, along the entering path. It is shown that coverage significantly improves by increasing the length of the detection zone if the tag's antenna is linearly polarized, while in case of circularly polarized tag's antenna this improvement is modest. Moreover, it is shown that for enough long entering paths a linearly polarized tag antenna can show better performance than a circularly polarized one. Circularly polarized tag's antenna is optimal choice if detecting zone is very narrow.

A Trapezoidal Microstrip Bandstop Filter with Efficient Suppression of Undesired Stopband

Nesic, D. A., Kolundzija, B. M., "A trapezoidal microstrip bandstop filter with efficient suppression of undesired stopbands", Optoelectronics and advanced materials – Rapid communications, Apr. 2010.

[Link to Publication](#)

Abstract: A new bandstop filter implemented as a cascade of trapezoidally shaped cells is presented. The proposed bandstop filter suppresses many undesired stopbands at higher frequencies. The cell design is specified by two variables and the initial filter is refined by optimizing the cell variables. The proposed design yields a robust structure suitable for fabrication. The proposed filter is fabricated and measured in a wide frequency range showing more efficient suppression than is reported in literature.

Analysis of Space Coverage in Far Field UHF RFID Systems

Kolundzija, B.M., Mrdakovic, B.Lj., "Analysis of space coverage in far field UHF RFID systems", International Workshop on Antenna Technology (iWAT), Digital Object Identifier: 10.1109/IWAT.2010.5464761, Lisbon, Feb. 2010.

[Link to Publication](#)

Abstract: In this paper, a new method for analysis of space coverage in UHF RFID systems is presented. The method is based on EM modeling of tags and reader antennas in desired RFID environment and post-processing of near field data taking into account arbitrary positions and orientations of tags. The method is illustrated for a case when collection of objects pass through the concrete gateway using one to three reader antennas in \hat{z} AND \hat{z} and \hat{z} OR \hat{z} scenario.

Reconfigurable UWB Antenna Operating in Two Different Sub-bands

Davidovic, M., Nikolaou, S., Vryonides, P., Kolundzija, B.M., "Reconfigurable UWB Antenna Operating in Two Different Sub-bands", Proceedings of EuCAP 2010, Barcelona, Spain, April 12-16, 2010.

[Link to Publication](#)

Abstract: In this paper a novel design of a wideband antenna that can operate in two different, complementary UWB sub-bands is presented. The proposed antenna is a dual layer design, consisting of a microstrip feed line with embedded PIN diodes on the back side of the board, and a circular slot with an elliptical patch within on the front side of the board. It can be switched between two states, one covering the lower frequency range 3.1–6 GHz, and the other one covering the upper frequency range 6–10.6 GHz. Operation principles are explained in detail and the antenna performance in both sub-bands is confirmed by fullwave analysis.

Extending the Reach of WIPL-D Pro on PCs – Revisited 5 Years Later

Sumic, D.S., Kolundzija, B.M., "Extending the Reach of WIPL-D Pro on PCs – Revisited 5 Years Later", 26th Annual Review of Progress in Applied Computational Electromagnetics (ACES), Tampere, Finland, pp. 667-672, April 26 - April 29, 2010.

[Link to Publication](#)

Abstract: -

2009

Optimizing the Shape of Antennas for Specific Time-Domain Responses

Olcan, D.I., Kolundzija, B.M., "Optimizing the Shape of Antennas for Specific Time-Domain Responses", IEEE International Symposium on Antennas and Propagation & USNC/URSI National Radio Science Meeting, Charleston SC, USA, June 1-5, 2009. IEEE Catalog Number: CFP09APS-CDR, ISBN: 978-1-4244-3647-7, ISSN: 152-3965.

[Link to Publication](#)

Abstract: -

Accurate Solution of Helical Antenna as Benchmark for Validation of Thin-Wire Modelling

Ponjavic, S.T., Kolundzija, B.M., "Accurate solution of helical antenna as benchmark for validation of thin-wire modelling", 3rd European Conference on Antennas and Propagation, EuCAP 2009, pp. 126-130, 2009.

[Link to Publication](#)

Abstract: In this paper, an accurate plate model of helical antenna is developed using WIPL-D Pro, a full wave 3D EM software. Realistic coaxial cable feed below PEC plane is used. All effects resulting from geometry and the principle of work for this type of antenna are fully taken into account, including proximity effect of helical

turns and higher order propagation modes at coaxial cable aperture. Thus, all simulation results of this model can be taken as very accurate, since this is confirmed by rigorous convergence tests. By comparing of these results with results of a wire model of helical antenna, limits and applicability of using wire model are precisely determined and explained.

2008

Diakoptic Approach to Simulation of Large Array of Microstrip Patch Antennas with Finite Ground Plane

Janic, B.B., Kostic, M., Kolundzija, B.M., "Diakoptic approach to simulation of large array of microstrip patch antennas with finite ground plane", IEEE International Conference on Microwaves, Communications, Antennas and Electronic Systems, COMCAS 2008, Digital Object Identifier: 10.1109/COMCAS.2008.4562821, 2008.

[Link to Publication](#)

Abstract: In this paper, diakoptic approach was proposed and can be used to predict radiation pattern of a large array with practically no loss of accuracy compared to simulation of full array. On the other hand the simulation times are greatly reduced using diakoptic approach, which makes it a method of choice for simulation of large and complex structures such as antenna arrays.

2007

Evaluation of Absorber Reflectivity Using a Directive Antenna Array

Janic, B.B., Kostic, M.M., Kolundzija, B.M., "Evaluation of Absorber Reflectivity Using a Directive Antenna Array", Proc. EuCAP Int. European Conf., CD ROM Edition: We2.10.9.pdf, Edinburgh, UK, Nov. 2007.

[Link to Publication](#)

Abstract: When designing an anechoic chamber, it can be of particular advantage to develop a proper model of RF absorber. Using the model it is possible to calculate absorber reflectivity in magnitude and phase, for various angles of incidence, for parallel and perpendicular polarizations. Absorber data sheets commonly specify only the magnitude of the absorber reflectivity for normal incidence. For all other relevant data it is more convenient to use simulation instead of measurements. The paper presents a method for evaluation of absorber reflectivity illuminated by an antenna array, using full wave simulation.

On the Calculation of Time-Domain Response of Antennas Mounted on Large Platforms

Olcan, D.I., Sumic, D.S., and Kolundzija, B.M., "On the Calculation of Time-Domain Response of Antennas Mounted on Large Platforms", Proc. EuCAP Int. European Conf., CD ROM Edition: Fr1.4.2.pdf, Edinburgh, UK, Nov. 2007.

[Link to Publication](#)

Abstract: We present an efficient and accurate approach for calculating time-domain responses of antennas mounted on electrically large platforms, such as airplanes, spacecrafts, ships, tanks, etc. The approach is based on the proficient frequency-domain analysis coupled with the inverse Fourier transform, in order to obtain time-domain responses. For the basic frequency-domain analysis we use method of moments (MoM) with higher-order basis functions and Galerkin testing procedure [3], incorporated in the WIPL-D Pro software package. If the analyzed antenna is mounted on the large platform the rigorous MoM analysis needs a lot of computer resources. However, the number of unknown coefficients for the approximation of the current distribution, needed in the frequency analysis, can be drastically reduced without losing the accuracy significantly [4]. We utilize that fact for the calculation of time-domain responses.

RF Absorber Reflectivity Evaluation Using RCS Calculation

Janic, B.B., Kolundzija, B.M., "RF Absorber Reflectivity Evaluation Using RCS Calculation", Proc. IEEE AP-S Int. Symp., pp. 6043-6046, CD ROM Edition: 1518.pdf), Honolulu, Hawaii, USA, July 2007.

[Link to Publication](#)

Abstract: This paper presents the method for evaluation of reflectivity of RF absorber using 3D electromagnetic solver WIPL-D Pro. Absorber design using measurement and trial method is a tedious and time consuming task, and proposed method can be used to make it easier and faster. It has been investigated what is the minimum size of the sample needed for accurate results, how conductivity of the material affects the reflectivity for normal incidence, what is the reflectivity of the absorber for various off normal incident angles for parallel and normal polarization of the wave.

2006

On the Optimal Dimensions of Helical Antenna with Truncated-Cone Reflector

Olćan D. I., Zajić A. R., Ilić M. M., Djordjević A. R., "On the Optimal Dimensions of Helical Antenna with Truncated-Cone Reflector", Proc. EuCAP Int. European Conf., Nice, France, 6 - 10 Nov. 2006

[Link to Publication](#)

Abstract: This paper presents optimization of a helical antenna with a truncated-cone reflector. We have found that the dimensions of the truncated-cone reflector and the dimensions of the helical antenna need to be optimized simultaneously to obtain the optimal design. Furthermore, we have found that the truncated-cone reflector can significantly increase the gain of the helical antenna compared to a circular or a square flat reflector. A set of diagrams is made to enable simple design of helical antennas with truncated-cone reflectors. Finally, the results are experimentally verified.

Coupling among Collocated Loops

Nikolić M. M., Djordjević A. R., Nehorai A., "Coupling among Collocated Loops", Proc. EuCAP Int. European Conf., Nice, France, 6 - 10 Nov. 2006

[Link to Publication](#)

Abstract: We analyze three orthogonal collocated loops using semi-analytical and numerical procedures. If a large number of terms is used, the currents in the loops converge to those of galvanically interconnected loops. The three loops are sensitive to positioning tolerances so that large coupling among them can occur in practice.

On the Simulation of RCS from Trees and Forests above Real Finite Ground

Olcan D. I., Kolundzija B. M., "On the Simulation of RCS from Trees and Forests above Real Finite Ground", Proc. EuCAP Int. European Conf., Nice, France, 6 - 10 Nov. 2006

[Link to Publication](#)

Abstract: We present a numerically efficient technique for simulating RCS from trees and forests. Furthermore, we included other objects positioned (potentially hidden) in forests and the finite real ground below. The exploration of forest density, real finite ground plane, and operating frequency is done. The software tool WIPL-D Pro v6.0 is used for all simulations.

Optimization of Resonant-Cavity Antenna

Djordjević A. R., Zajić A. G., "Optimization of Resonant-Cavity Antenna", Proc. EuCAP Int. European Conf., Nice, France, 6 - 10 Nov. 2006

[Link to Publication](#)

Abstract: An optimized low-profile antenna that consists of a rectangular resonant cavity and nonuniform radiation slots is presented. The antenna has a pencil-beam radiation pattern, low sidelobes, and can handle two orthogonal polarizations. The antenna design is verified by simulations and experimental results.

Efficient RCS Calculation of Fighter Airplane on a PC Using Maximally Orthogonalized Higher Order Basis Functions

Sumic D. S., Kolundzija B. M., "Efficient RCS Calculation of Fighter Airplane on a PC Using Maximally Orthogonalized Higher Order Basis Functions", Proc. EuCAP Int. European Conf., Nice, France, 6 - 10 Nov. 2006

[Link to Publication](#)

Abstract: Computation of RCS of electrically large bodies is memory and time-demanding. Various high frequency/asymptotic computational methods have been presented with the aim of reducing memory and time requirements, but with loss of accuracy.

Improving Radiation Pattern of Microstrip Antennas

Nikolić M. M., Djordjević A. R., "Improving Radiation Pattern of Microstrip Antennas", Proc. EuCAP Int. European Conf., Nice, France, 6 - 10 Nov. 2006

[Link to Publication](#)

Abstract: It was shown in [1] that polarization currents in the dielectric substrate of microstrip antennas cause deterioration of the radiation pattern. We further study this effect analytically and numerically, with emphasis on techniques for improving the radiation pattern.

Optimization of Umbrella Top-Loaded Shunt-Fed Monopole Antenna for MF Digital Radio Using WIPL-D Microwave Software

Petrović V. V., Surutka J. V., "Optimization of umbrella top-loaded shunt-fed monopole antenna for MF digital radio using WIPL-D Microwave software", Proc. of XIV TELFOR (Telecommunications Forum), pp. 425 – 428, Belgrade, 21-23 Nov. 2006

[Link to Publication](#)

Abstract: Electrically short ($h / 0.17 \lambda =$) medium frequency (MF) monopole antenna was redesigned in order to be used for both analog and digital broadcast. Necessary impedance and bandwidth was achieved by the capacitive umbrella top-loading and a shunt-fed design. In order to achieve desired specifications, antenna dimensions and a simple matching network parameters were simultaneously optimized by a specialized software WIPL-D Microwave.

2005

High Efficiency Patch Antenna for 24 GHz Anticollision Radar

Slovic, M., Jokanovic, B., Kolundzija, B., "High efficiency patch antenna for 24 GHz anticollision radar", Proc. 7th TELSIS (Int. Conf. on Telecommunications in Modern Satellite, Cable and Broadcasting Services), vol. 1. pp. 20 – 23, Niš, 28-30 Sept. 2005.

[Link to Publication](#)

Abstract: This paper presents design and measured results in synphase patch antenna for anticollision radar at 24 GHz. The antenna consists of two linear arrays of 24 serially connected patches. The aim was to design

an antenna that in azimuth has lobes below -20 dB in ISM range of 24.05-24.25 GHz, at which the anticollision radar operates. The realized antenna has gain of 21.75 dB and efficiency of 60% at the frequency of 24.1 GHz. Three-decibel bandwidth in azimuth is 3.6° and in elevation is 46°. In the range of 24.05-24.25 GHz, gain is higher than 21.15 dB and the reflection coefficient is below -14 dB.

Microstrip Antennas with Suppressed Radiation in Horizontal Directions and Reduced Coupling

Nikolic, M.M., Djordjevic, A.R., Nehorai, A., "Microstrip antennas with suppressed radiation in horizontal directions and reduced coupling", IEEE Trans. on Antennas and Propagat., vol. 53, no. 11, pp. 3469 – 3476, Nov. 2005.

[Link to Publication](#)

Abstract: Microstrip (patch) antennas usually strongly radiate in directions along the ground plane. This effect causes unwanted radiation patterns and increased coupling among array elements. Dielectric polarization currents are identified as physical sources of this radiation. A general technique is proposed to compensate these currents and suppress radiation in horizontal directions.

2004

Precise and Efficient EM Modeling of Trees with WIPL-D Code

Olcan, D. I. and Kolundzija, B. M., "Precise and efficient EM modeling of trees with WIPL-D code", Proc. of ACES Int Symp., CD ROM Edition: S10P03.pdf, Syracuse, 19-23 Apr. 2004

[Link to Publication](#)

Abstract: Electromagnetic tree modeling with metallic wires and plates, with distributed loadings, is presented in this paper. The approach proved to be useful at least for VHF frequency range and possibilities for extending frequency range are discussed. Stochastic algorithm for building WIPL-D models of trees is briefly described. Scattering from trees is calculated and presented for several tree examples to see how RCS clutter changes with involving more and more details in tree models. Limits for applications of proposed models are discussed, too.

Full 3D EM Modeling of Yagi Antenna for WLAN

Kolundzija, B. M. and Tasic, M. S., "Full 3D EM modeling of yagi antenna for WLAN", Proc. of ACES Int Symp., CD ROM Edition: S10P07.pdf, Syracuse, 19-23 Apr. 2004

[Link to Publication](#)

Abstract: The paper shows how precisely one can model Yagi antenna for WLAN with all accompanying elements (dielectric carrier, U-balun, radome), and how these elements influence the antenna characteristics. The investigation is based on simulation of a typical high gain Yagi antenna and comparison these results with measurements. It is found that dielectric carrier can be omitted from analysis, U-balun should be included for reflection coefficient results, while influence of radome is significant for both reflection coefficient and radiation pattern.

2003

Broadband Cross-Polarized Bowtie Antenna for Breast Cancer Detection

Yun X., Fear, E.C., Johnston, R., "Broadband cross-polarized bowtie antenna for breast cancer detection", Proc. IEEE AP-S Int. Symp., vol. 3, pp. 1091 – 1094, Columbus, 22-27 June 2003

[Link to Publication](#)

Abstract: Currently, various approaches to microwave breast cancer detection are being investigated by several research groups. Microwave approaches are expected to provide complementary information to that obtained with mammography, the gold standard method for breast imaging. Microwave images are related to the electrical properties of tissues, and there is some evidence to suggest that a contrast exists between normal healthy breast tissues and malignant tumors. In this paper, we investigate the frequency responses of tumors in a simple breast model using computer simulations over the frequency range of 2 to 4.25 GHz. Also, the influence of a variety of parameters (e.g. tumor shape, size, location and depth) on the frequency response is examined.

Antenna Optimization using Combination of Random and Nelder-Mead Simplex Algorithms

Kolundzija, B. M., Olcan, D. I., "Antenna Optimization using Combination of Random and Nelder-Mead Simplex Algorithms", Proc. IEEE AP-S Int. Symp., Columbus–Ohio, Vol. 1, pp. 185-188, 2003

[Link to Publication](#)

Abstract: We present a relatively simple and robust algorithm for finding optimal and near optimal solutions for antenna design based on a combination of random and Nelder-Mead simplex algorithms. We considered the design of a Yagi-Uda antenna, as an example, for two reasons: it has many near optimal solutions; analysis of such an antenna is relatively quick. The presented combinations of random and Nelder-Mead methods are relatively simple and robust optimization algorithms. They can be advantageous in situations where the error function (the difference between the given criteria and the found solution) has many local minima of approximately the same depth or when formulation of the error function is complicated due to multiple involved criteria. Insight into near optimal solutions, which could be easily found using the proposed methods, offers more freedom in antenna design.

WIPL Code Validation for Metallic Structures

Djordjevic, A. R., Kolundzija, B. M., Zajic, A. G., Nikolic, M. M., Sotirovic, H. H., Stekovic, A. S., "WIPL Code Validation for Metallic Structures", Proc. of 19th Applied Computational Electromagnetics Conf., Monterey, CA, pp. 264-269, March 2003

[Link to Publication](#)

Abstract: There are several sensitive spots in the WIPL analysis of the interdigital microwave filters. If it is not treated properly, the end effect causes significant errors in determination of their central frequencies. Coarse segmentation leads to underestimated coupling among transmission lines. Proper and careful modeling in WIPL can improve the overall accuracy of the numerical results. To that purpose, several metallic interdigital filters have been designed, machined, measured, and modeled by WIPL. The theoretical results were refined with the aim to match experimental data. Hence, guidelines are derived about the required accuracy of integration and approximation in WIPL, as well as subdivision of critical surfaces. The deducted rules can serve in the analysis of similar classes of coupled-line microwave filters, such as combline filters.

2002

Koaksijalno-talaso vodni prelaz sa ukrstenom polarizacijom na 23 GHz

Micic, Z., Jokanovic, B. i Kolundzija, B., "Koaksijalno-talaso vodni prelaz sa ukrstenom polarizacijom na 23 GHz", Zbornik radova XLVI konf. ETRAN-a, Banja Vrucica - Teslic, 2002.

[Link to Publication](#)

Abstract: -

Precise Modeling of Microstrip Patch Antennas (Finite Metalisation, Substrate, and Ground)

Kolundzija, B., Bajic, B., "Precise modeling of microstrip patch antennas (finite metalisation, substrate, and ground)", Proc. IEEE AP-S Int. Symp., San Antonio, vol. 3, pp. 434-437, 2002.

[Link to Publication](#)

Abstract: -

Accurate Modelling and Measurements of a Mobile Handset EM Radiation

Alexandridis, A.A., Petrovic, V.V., Dangakis, K., Kolundzija, B.M., Kostarakis, P., Nikolic, M., Zervos, T., Djordjevic, A.R., "Accurate Modelling and Measurements of a Mobile Handset EM Radiation", Proceedings of The 2nd International Workshop on Biological Effects of Electromagnetic Fields, Rhodes, Greece, pp. 251-259, 2002.

[Link to Publication](#)

Abstract: -

Some Validation Cross-Checks for the WIPL Code

Wood P. J., Kolundzija, B., "Some Validation Cross-Checks for the WIPL Code", Proc. of the 18th Applied Computational Electromagnetics Conf., Monterey, CA., pp 623-632, March 2002.

[Link to Publication](#)

Abstract: -

On the Limits of WIPL-D Code

Kolundzija, B., Ognjanovic J., Sarkar T., "On the limits of WIPL-D code", Proc. of the 18th Applied Computational Electromagnetics Conf., Monterey, CA., pp 615-622, March 2002.

[Link to Publication](#)

Abstract: -

2001

Analysis of Parasitic Effects in Double-Y Baluns

Jokanović, B., Marinčić, A., Kolundzija, B., "Analysis of parasitic effects in double-Y baluns", IEE Proc. Microw. Antennas Propag., vol. 148, no. 4, pp. 239-245, Aug. 2001

[Link to Publication](#)

Abstract: Effects limiting the bandwidth of a double-Y balun that transforms a finite-ground-plane coplanar waveguide (CPWFGP) to a coplanar strip line (CPS) are investigated both theoretically and experimentally. Analysis shows two kinds of parasitic effects: parasitic effects that depend on the electrical length of the input transmission lines for the even and balanced modes, and those that depend on the length of the open- and short-circuited stubs, which are observed in both the regular odd mode and balanced mode. The developed theory allows the parasitic resonances in CPWFGP-CPS baluns to be predicted and shifted out of the operating frequency bandwidth by changing the corresponding physical dimensions of the balun. Theoretical results have been experimentally verified

Precise Modeling of Antenna Towers

Tasić, M., Kolundzija, B., and Djordjević, A., "Precise modeling of antenna towers", Journal Facta Universitatis, Series: Electronics and Energetics, 2001

[Link to Publication](#)

Abstract: Modern numerical methods can be used for very precise modeling of antenna towers. However, creation of precise models can be very tedious and the corresponding analysis can be very time consuming. The paper investigates under which conditions the complex antenna towers can be represented by single wire equivalents

Characterization of Direct Electromagnetic Coupling Occurring in the Vicinity of the Lower Modes in Reverberation Chamber

Klingler, M., Deniau, V., Koné, L., Demoulin, B., and Kolundzija, B., "Characterization of Direct Electromagnetic Coupling Occurring in the Vicinity of the Lower Modes in Reverberation Chambers", 14th International Zurich Symposium & Technical Exhibition on EMC, Zurich, paper no. 120R3, February 2001

[Link to Publication](#)

Abstract: -

Analysis of a Hemispherical Dielectric Resonator Antenna with Very High Permittivity Using WIPL-D

Jang, S., Kolundzija, B., and Sarkar T. K., "Analysis of a hemispherical dielectric resonator antenna with very high permittivity using WIPL-D", Proc. of 17th Applied Computational Electromagnetics Conf., Monterey, CA, pp. 301-308, March 2001

[Link to Publication](#)

Abstract: -

CAD Formulas of Microstrip Line with Perforated Ground Plane by Synthetic Asymptote

Chow, J. L., Sarkar T. K., Wan K. L., and Kolundzija, B., "CAD formulas of microstrip line with perforated ground plane by synthetic asymptote", Proc. of IEEE MTT Int. Microw. Symp., Phoenix, pp. 1757-1760, May 2001

[Link to Publication](#)

Abstract: CAD formulas of a microstrip line with a periodically perforated ground plane are derived for possible application in LTCC packages. The derivation is done by the novel technique of synthetic asymptote. Compared with the hardware experiment, the errors of the CAD formulas can be as low as 2%

Precise Analysis of Commercial Log-Periodic Dipole Arrays Using Wire-Antenna Algorithms

Djordjević, A., Zajić A., Kolundzija, B., and Sarkar T., "Precise Analysis of Commercial Log-Periodic Dipole Arrays Using Wire-Antenna Algorithms", Proc. USNC/URSI National Radio Science Meeting, Boston, p. 90, July 2001

[Link to Publication](#)

Abstract: -

Analysis of a Hemispherical Dielectric Resonator Antenna with very High Permittivity

Jang, S., Kolundzija, B., and Sarkar T. K., "Analysis of a hemispherical dielectric resonator antenna with very high permittivity", Proc. IEEE AP-S Int. Symp., Boston, vol. 1, pp. 330-333, July 2001

[Link to Publication](#)

Abstract: The analysis of very high permittivity ($\epsilon_r=169$) structure using WIPL-D, a software package for electromagnetic modeling of composite metallic and dielectric structures, is presented. As an example, a microstrip patch hat antenna is treated. Network parameters, radiation pattern and current distributions on the surface are analyzed

Precise Modeling of Antenna Towers

Tasić, M., Kolundzija, B., and Djordjević, A., "Precise modeling of antenna towers", Proc. 5th TELSIS (Int. Conf. on Telecommunications in Modern Satellite, Cable and Broadcasting Services), Niš, Sep. 2001

[Link to Publication](#)

Abstract: Modern numerical methods can be used for very precise modeling of antenna towers. However, creation of precise models can be very tedious and the corresponding analysis can be very time consuming. The paper investigates under which conditions the complex antenna towers can be represented by single wire equivalents

Analysis of Transmission Line Structures Using a Dynamic Analysis Through WIPL-D

Stamm, J., Sarkar, T., Kolundzija, B., and Salazar-Palma, M., "Analysis of transmission line structures using a dynamic analysis through WIPL-D", Electrical Performance of Electronic Packaging, pp. 55 -58, Oct. 2001

[Link to Publication](#)

Abstract: In packaging systems it is necessary to compute radiation from printed circuits. Analysis of radiation from printed circuits is quite difficult because the codes that are generally used for fast efficient calculation of transients on these systems due to different loads are often not capable of analyzing radiation. On the other hand, dynamic solutions that calculate radiation from printed circuits often require large computational resources as it needs to calculate the electric fields from structures that are very closely spaced and thus

require significant computational accuracy. What we show is that using entire domain basis one can provide accurate dynamic solutions for transmission like structures. Because in this expansion one uses an entire domain basis, the charge along the structure is continuous and therefore provides accurate values of the near fields. Typically in using an entire domain basis one can reduce the size of the matrix on large structures typically by a factor of ten. Hence large packaging problems can be solved using modest computational resources quite efficiently. Numerical results are presented to illustrate these principles

2000

Analysis of Electromagnetic Radiation from Composite Lossy Material Bodies Using WIPLM

Kolundzija, B., Djordjević, A. R., Sarkar, T. K., and Zhang J., "Analysis of electromagnetic radiation from composite lossy material bodies using WIPLM", Proc. PIERS (Progress in Electromagnetics Research Symposium), Cambridge, July 2000

[Link to Publication](#)

Abstract: -

Theoretical and Experimental Investigation of Parasitic Effects in Double-Y Baluns

Jokanović, B. Marinčić, A., and Kolundzija B., "Theoretical and Experimental Investigation of Parasitic Effects in Double-Y Baluns", Journal Facta Universitatis, Series: Electronics and Energetics, vol. 13, no. 2, pp. 219-230, Aug. 2000

[Link to Publication](#)

Abstract: Effects limiting the bandwidth of CPWFGP-CPS double-Y baluns are investigated both theoretically, using 3D electromagnetic simulators and experimentally. Analysis shows two kinds of parasitic effects: (a) parasitic effects that depend on input transmission lines and they are caused by: (a) even mode and parasitic balanced mode (PBM) and (b) parasitic effects that depend on open and short circuited stubs forming the double-Y balun and they are observed in both regular mode and PBM. This theory has been experimentally proven and it enables to predict the frequency of parasitic resonances that appear in the characteristics of CWFGP-CPS baluns and shift them out of the operating frequency bandwidth by changing the physical dimensions of the balun

Dual-Band Glass-Mounted Car Antenna for Mobile Phone

Niccolai, L., Djordjević A., and Kolundzija, B., "Dual-band glass-mounted car antenna for mobile phone", Proc. USNC/URSI National Radio Science Meeting, Salt Lake City, p. 368, July 2000

[Link to Publication](#)

Abstract: -

1999

Efficient and Accurate Inclusion of Radomes into Antenna Analysis

Kolundzija, B., Tasić, M., and Sarkar, T., "Efficient and accurate inclusion of radomes into antenna analysis", Proc. IEEE AP-S Symp., Orlando, pp. 842-845, Jun 1999

[Link to Publication](#)

Abstract: In the general case a radome enclosing an antenna introduces changes in both the antenna input admittance and its radiation pattern. The main goal of this paper is to present a method for efficient analysis of radomes including their interactions with antennas. The method is a variant of the method of moments

1998

Wide-Band Properties of Two Mutually Coupled Printed Dipole Elements

Mikavica, M., Kolundzija, B. M., Nešić A., and Marjanović, M., "Wide-band properties of two mutually coupled printed dipole elements", Proc. ANTEM (Symp. on Antenna Technology and Applied Electromagnetics), pp. 615-618, Ottawa, Oct. 1998

[Link to Publication](#)

Abstract: Properties of a novel broadband printed antenna element, printed counterpart of the conventional TV UHF panel antenna with very large bandwidth, has been studied. A design method and realization is presented in the paper. More than one octave measured bandwidth with VSWR less than 1.8 and directivity between 9.0 and 11.0 dBi has been achieved. Properties of the radiator as an array element have also been investigated.

A Novel Broad-Band Printed Antenna Element

Mikavica, M., Kolundzija, B. M., Nešić A., and Marjanović, M., "A novel broad-band printed antenna element", Proc. MELLECON (Mediterranean Electrotechnical. Conf.), Tel-Aviv, vol. 1, pp. 256-259, May 1998

[Link to Publication](#)

Abstract: A novel broadband printed antenna element, the printed counterpart of a conventional TV UHF panel antenna with very large bandwidth, has been studied. A design method and realization are presented in the paper. More than one octave measured bandwidth with VSWR less than 1.8 and directivity between 9.0 and 11.0 dBi has been achieved. Properties of the radiator as an array element have also been investigated

1997**Design of Monopole Antenna Mounted on Shaped Circular Reflector for mm-wave Applications**

Kolundzija, B. M., Branković, V., and Zimmermann, S., "Design of monopole antenna mounted on shaped circular reflector for mm-wave applications", Proc. 10th ICAP, pp. 1460-1463, Edinburgh 1997

[Link to Publication](#)

Abstract: A new omnidirectional antenna for mm-wave applications is suggested. The antenna is in the form of monopole mounted on a conical circular reflector with smooth edges and a small pedestal in the middle. Following design procedure is suggested: (a) the main beam is positioned to the desired angle by changing the angle of the cone reflector, (b) the sidelobes are influenced by optimizing the pedestal. By using suggested design procedure two antennas operating in the range from 57 GHz to 63 GHz are modeled: (a) an antenna for broadband radio channel measurements, and (b) an indoor base station antenna with cosecant radiation pattern. The antennas are fabricated and measured. Good agreement between simulated and measured results is obtained

1996**Analysis of Prime-Focus Reflector Antennas by WIPL Code**

Kolundzija, B. M., "Analysis of prime-focus reflector antennas by WIPL code", Proc. Trans Black Sea Region symp. on Applied Electromagnetics, Metsovo, (Greece), April 1996 (summary)

[Link to Publication](#)

Abstract: -

Efficient Analysis of Horn Antennas by Using WIPL Code at Personal Computers

Kolundzija, B. M., Nikolajević, V., Marinčić, A. and Sarkar T., "Efficient analysis of horn antennas by using WIPL code at personal computers", Proc. IEEE AP-S Int. Symp., Baltimore, pp. 268-271, June 1996

[Link to Publication](#)

Abstract: -

Analysis of Prime-Focus Reflector Antennas by WIPL Code

Kolundzija, B. M. and Sarkar T., "Analysis of prime-focus reflector antennas by WIPL code", Proc. 26th EuMc, Prague, pp. 781-785, Sep. 1996

[Link to Publication](#)

Abstract: -

Feasibility Study of mm-wave Metal Antennas

Kolundzija, B. M., Branković, V., Zimmermann, S. and Forster, E., "Feasibility study of mm-wave metal antennas", Proc. ACTS Mobile Telecommunications Summit, Granada, pp. 295-301, 1996

[Link to Publication](#)

Abstract: -

Analysis of Horn Antennas Using the Method of Moments

Kolundzija, B. M., Nikolajević, V., and Marinčić, A., "Analysis of horn antennas using the method of moments", Journal Facta Universitatis, Series: Electronics and Energetics, vol. 9, no. 1, pp. 21-34, 1996

[Link to Publication](#)

Abstract: A new method for the analysis of horn antennas is presented. The method is based on determination of the approximate current distribution over the antenna walls. The electric field integral equation for current distribution is solved using the EDG method (Entire-Domain Galerkin method), which represents a very efficient variant of the MoM (Method of Moments). The proposed method enables that real structure, including the feed, can be analyzed. As a result the radiation pattern can be precisely calculated in all directions, which is not the case with other known methods. Presented numerical and measured results show very good agreement, thus illustrating the great possibilities of the proposed method in the analysis of such antennas.

1987

Analysis of a Class of Symmetrical Thin-Plate Triangular Antennas

Popović, B. D. and Kolundzija, B. M., "Analysis of a class of symmetrical thin-plate triangular antennas", Proc. IEE H, vol. 134, no. 2, 1987

[Link to Publication](#)

Abstract: A method is presented for the analysis of a class of symmetrical thin-plate triangular antennas. The antenna current distribution is obtained by solving the two-potential equation by means of the point-matching method with a polynomial approximation for the current distribution. The edge effect is taken into account by introducing line currents at the edges. To obtain an accurate and stable solution, point-matching equations and conditions for currents at the discontinuities are used to form an overdetermined system of

complex linear equations which is then solved in the least-squares sense. Theoretical and experimental results are presented, showing good agreement and illustrating the antenna properties.

1986

Analysis and Synthesis of a Class of Broadband Symmetrical Planar Antennas

Kolundzija, B. M. and Popović, B. D., "Analysis and synthesis of a class of broadband symmetrical planar antennas", Proc. URSI Conf., Budapest, pp. 669-672, 1986

[Link to Publication](#)

Abstract: -

1982

Analysis of Dipole Antenna with Corner Reflector

Kolundzija, B. M. and Djordjević, R. A., "Analysis of dipole antenna with corner reflector", Proc. 7th MICROCOLL symp., Budapest, pp. 319-322, 1982

[Link to Publication](#)

Abstract: -