

2011 VIII International Conference on Antenna Theory and Techniques

(ICATT 2011)

**Kyiv, Ukraine
20 – 23 September 2011**



**IEEE Catalog Number: CFP11540-PRT
ISBN: 978-1-4577-2211-0**

TABLE OF CONTENTS

INVITED PAPERS (PL)

1.	ANTENNA SCIENCE ATLANTES Ya. S. Shifrin and V. F. Kravchenko	3
2.	RECENT ADVANCES IN ANTENNA RESEARCH AND DEVELOPMENT AT THE NATIONAL TECHNICAL UNIVERSITY OF UKRAINE “KYIV POLYTECHNIC INSTITUTE” F. F. Dubrovka, V. M. Hlushenko, M. O. Dovbush, R. F. Dubrovka, M. M. Lytvyn, S. M. Lytvyn, I. M. Markovich, Yu. I. Markovich, S. Ye. Martynyuk, Yu. A. Ovsianyk, B. V. Shevchuk, O. V. Tolkachov, D. O. Vasylenko, O. S. Zakharchenko	8
3.	BIOCHEMICAL OBSERVATIONAL SCIENCE AT THz ENERGIES R. Donnan and R. Dubrovka	13
4.	STUDIES ON RADAR MEDICAL SENSORS A. Boryssenko and E. Boryssenko.	19
5.	LARGE-APERTURE SLOTTED-WAVEGUIDE ANTENNA ARRAYS: DEVELOPMENT AND FABRICATION ADVANCES S. S. Sekretarov, A. V. Somov, and D. M. Vavriv	22
6.	NEAR-FIELD MANIPULATION BY MEANS OF WIRE MEDIA R. Dubrovka and P. Belov	28
7.	VEHICULAR ANTENNAS FOR SATELLITE COMMUNICATIONS (SURVEY) A. V. Shishlov	34
8.	SYNTHESIS OF ARBITRARILY SHAPED IMPEDANCE REFLECTORS Y. V. Yukhanov, A. Y. Yukhanov, T. Y. Privalova	40
9.	WAVEFIELD CONTROL IN MULTIMODE CHANNELS BY THE USE OF SOURCE ARRAYS, WITH APPLICATION TO SHALLOW-WATER SOUND A. G. Luchinin, A. I. Malekhanov, and A. I. Khil'ko	46
10.	THIRTY YEARS EXPERIENCE IN DEVELOPMENT OF ADAPTIVE LATTICE FILTERS THEORY, TECHNIQUES AND TESTING IN KHARKIV D. I. Lekhovyt'skiy	51
11.	EVOLUTION OF ELECTROMAGNETIC WAVES RADIATED BY A HERTZIAN DIPOLE V. I. Naidenko	63
12.	NUMERICAL-ANALYTICAL IMPLEMENTATION OF GALERKIN TECHNIQUE FOR ANALYSIS OF WAVEGUIDE AND SLOTTED WAVEGUIDE ANTENNA ARRAYS M. B. Manuilov, A. M. Lerer and G. P. Sinyavsky	69

GENERAL ANTENNA THEORY (GAT)

1.	TO HISTORY OF RADIO ENGINEERING'S TERM “ANTENNA” V. I. Slyusar	83
2.	THE ENERGY OF THE FIELD RADIATED BY HERTZ DIPOLE I. S. Volvach, O. M. Dumin, and O. O. Dumina	86
3.	SHAPE TRANSFORMATION OF WAVE BEAMS FALLING ON QUASIPERIODIC LAYERED STRUCTURES M. Andreev, V. Borulko, O. Drobakhin, and D. Sidorov	89
4.	ORIENTATION AND DISPERSION DIAGRAMS OF SPATIALLY-POLARIZING SELECTIVE STRUCTURES IN THE FORM OF THE CYLINDER WITH THE STAR CONTOUR E. D. Bezuglov, Y. D. Bezuglov, and D. D. Gabriel'yan	92
5.	SPECTRUM EXTRAPOLATION FOR COMPLEX SOURCES VIA TWO-CHANNEL VERSION OF A PRINCIPLE OF MINIMAL SPATIAL EXTENSION OF SOLUTION V. F. Borulko and S. M. Vovk	97
6.	COUPLED PLASMA CYLINDRICAL COLUMNS AS SUB-WAVELENGTH ANTENNA N. P. Stogniy and N. K. Sakhnenko.	103

7.	DIFFRACTION PROBLEM IN BISTATIC ZONE OF RADIO ACOUSTIC SOUNDING SYSTEMS N. I. Slipchenko, Liu Chang, and A. Yu. Panchenko	112
----	---	-----

ANTENNA ARRAYS (AA)

1.	DETECTION OF SOLID EARTH EXCITATIONS BY LASER SEISMO-ACOUSTIC ANTENNA ARRAY V. V. Kravtsov, M. N. Dubrov, and M. S. Remontov	117
2.	NOISE-PROTECTED ANTENNA FOR A PULSE ACOUSTIC ATMOSPHERIC SOUNDER Ya. S. Shifrin, Y. N. Ulianov, V. I. Vetrov, V. L. Misailov	120
3.	THE EFFECT OF DEFECTIVE RADIATORS AND MODULES ON CHARACTERISTICS OF ARRAY ANTENNA WITH COMPLEX APERTURE AND MULTI-FACETED ARRAY ANTENNA V. Kizimenko, D. Moskaliov, N. Naumovich, A. Yubko, and O. Yurtsev	126
4.	THE INFLUENCE OF INTERCHANNEL AND INTRACHANNEL NONIDENTITIES ON ANTENNA ARRAY CHARACTERISTICS V. Kizimenko, D. Moskaliov, N. Naumovich, O. Yurtsev	129
5.	CHARACTERISTICS OF LINEAR SLOTTED WAVEGUIDE ARRAYS ON THE RECTANGULAR WAVEGUIDE WITH TWO-LAYER DIELECTRIC FILLING AT EXCITATION BY THE SLOWED DOWN DOMINANT MODE A. A. Lyakhovsky, A. F. Lyakhovsky, N. K. Blinova, and L. P. Yatsuk	132
6.	THE DIRECTION FINDING ACCURACY OF THE RECTANGULAR DIGITAL ANTENNA ARRAY IN A CASE OF ADC JITTER M. V. Bondarenko	137
7.	PYRAMIDAL DESIGN OF NANOANTENNA ARRAYS V. I. Slyusar and D. V. Slyusar	140
8.	ANTENNAS BASED ON DIELECTRIC RESONATORS AND MICROSTRIP LINES IN CASE OF THEIR ORTHOGONAL MUTUAL ORIENTATION I. V. Trubarov	143
9.	AN ESTIMATION OF DIRECTIVITY CHARACTERISTICS OF ANTENNA ELEMENTS IN ANTENNA ARRAY WITH COUNTING OF SIGNAL CONJUGATE COMPONENTS V. S. Koptievskaya and V. I. Slyusar	148
10.	NEW BROADBAND MICROSTRIP ANTENNA DESIGN V. Kizimenko	153
11.	RECEIVING LINEAR ANTENNA ARRAYS INTEGRATED WITH CDHGT HOT-ELECTRON BOLOMETER FOR THZ IMAGING SYSTEMS F. F. Dubrovka, D. S. Krasilnikov, and V. A. Petriakov	156
12.	EFFICIENCY OF A VEE-DIPOLE ANTENNA ARRAY PLACED OVER THE INTERFACE BETWEEN TWO MEDIA Yu. A. Panchenko	159
13.	PECULIARITIES OF NUMERICAL SIMULATION OF DIRECTIONAL CHARACTERISTICS OF ANTENNA ARRAY WITH MULTIFREQUENCY APERTURE CURRENTS A. V. Bezverhij, Y. N. Sedyshev, A. F. Shevchenko, and V. A. Tyutyunnik	161

WIDEBAND, ULTRAWIDEBAND AND MULTIFREQUENCY ANTENNAS (WUMA)

1.	FULL BAND UWB FRONT-END SOLUTION INCORPORATING TWO ANTENNAS R. Kravchenko, F. Rak, and M. Stadler	167
2.	A HIGH PERFORMANCE ULTRAWIDEBAND ORTHOMODE TRANSDUCER AND A DUAL-POLARIZED QUAD-RIDGED HORN ANTENNA BASED ON IT F. F. Dubrovka and S. I. Pilyay	176
3.	THE MULTIBAND ANTENNA A. A. Savochkin and A. A. Nudga	182

4.	UWB ANTENNA DESIGN CONCEPT FOR NEAR FIELD APPLICATIONS Ye. S. Maksimovitch, V. A. Mikhnev, and P. Vainikainen.	185
----	---	-----

LOW GAIN ANTENNAS (LGA)

1.	RADIATION POLARIZATION CONTROL OF THE TURNSTILE ANTENNA WITH IMPEDANCE VIBRATORS V. M. Dakhov, V. A. Katrich, M. V. Nesterenko, and S. L. Berdnik .	199
2.	CHARACTERIZATION OF THE EAR-TO-EAR PROPAGATION CHANNEL USING MICROSTRIP DIPOLE ANTENNAS A. Vasylenko, C. Hennemann, and R. Dubrovka	202
3.	OPTIMIZED VIBRATOR RADIATOR WITH FLAT FINITE SIZE SCREEN N. N. Gorobets and N. P. Yelisseyeva	205
4.	ELECTRICALLY SMALL WIRE ANTENNAS FOR ROCKET AND SPACE RADIO COMMUNICATIONS SYSTEMS V. V. Ovsyanikov, O. L. Makarov, O. L. Ol'shevs'kiy, G. V. Petrenko, V. M. Popel', Y. D. Romanenko.	208
5.	DOUBLE-POLARIZATION ANTENNA FOR MIMO SYSTEM OF WIRELESS COMMUNICATION S. V. Nesteruk and P. I. Travkin.	214
6.	SEVERAL NOVEL WIRE ANTENNA DESIGNS WITH THE QUASI-ISOTROPIC RADIATION PATTERNS IN HORIZONTAL PLANE O. Yurtsev, Y. Bobkov, and S. Baty	217
7.	A PURE CIRCULAR POLARIZATION ANTENNA WITH QUASI-HEMISPHERICAL RADIATION PATTERN F. F. Dubrovka and O. V. Tolkachov	223
8.	CONTROL OF DIPOLE RADIATION PATTERN USING CYLINDRICAL METAMATERIALS STRUCTURES O. S. Labun'ko	226

ANALYTICAL AND NUMERICAL METHODS (ANM)

1.	ALGORITHMS SYNTHESIS AND POTENTIALITY ANALYSIS OF OPTIMUM ULTRAWIDEBAND SIGNAL PROCESSING IN THE RADIOMETRIC SYSTEM WITH MODULATION V. K. Volosyuk, V. V. Pavlikov, S. S. Zhyla	235
2.	OVERVIEW AND COMPARATIVE ANALYSIS OF TOEPLITZ COVARIANCE MATRIX ESTIMATION METHODS FOR SPACE-TIME SIGNAL PROCESSING A. V. Semeniaka and D. S. Rachkov	238
3.	SYNTHESIS OF AMPLITUDE RADIATION PATTERN FOR PLANE WAVEGUIDE ARRAY USING THE VARIATIONAL APPROACH AND METHOD OF APERTURE ORTHOGONAL POLYNOMIALS M. I. Andriychuk and V. P. Tkachuk	244
4.	THE MATHEMATICAL FEATURES OF THE SYNTHESIS OF ANTENNAS WITH A FLAT APERTURE ACCORDING TO THE PRESCRIBED AMPLITUDE DIRECTIVITY PATTERN P. O. Savenko and M. D. Tkach.	247
5.	MODELING OF NONLINEAR EFFECTS IN HTS RESONATOR A. I. Luchaninov, E. V. Krykun, D. S. Gavva	250
6.	SINGULAR INTEGRAL EQUATIONS METHOD IN MATHEMATICAL MODELING OF SPECIFIC OPEN CONICAL STRUCTURE EXCITATION V. A. Doroshenko, A. P. Blishun, Y. D. Shimuk, N. G. Zuev	254
7.	SYNTHESIS CRITERIA FOR LINE/WAVEGUIDE JUNCTION DESIGN Y. A. Zakharia	257

ANALYTICAL AND NUMERICAL TECHNIQUES (ANT)

1.	VISUALLY LOSSLESS COMPRESSION OF SYNTHETIC APERTURE RADAR IMAGES N. N. Ponomarenko, V. V. Lukin, and K. O. Egiazarian	263
2.	GENERATION OF DECELERATING AIRY PULSES A. G. Nerukh, D. A. Zolotariov, and D. A. Nerukh	266
3.	APPLICATION OF LOCAL PLANE WAVE DECOMPOSITION FOR DETERMINATION OF RADIATION FIELD OF SECONDARY APERTURE M. V. Andreev and V. F. Borulko	272
4.	APPLICATION OF PENETRATING AREA METHOD TO CALCULATE WAVEGUIDE PHASED ANTENNAS ARRAY WITH MAGNETIC-DIELECTRICAL MATERIALS S. V. Marchenko and V. M. Morozov	275
5.	CALCULATION OF THE FIELD OF PERIODICALLY NONUNIFORM DIELECTRIC PLATE BY THE METHOD OF A. F. CHAPLIN V. V. Hoblyk, V. A. Pavlysh, and I. V. Nychai.	278
6.	ANALYSIS OF RADIATION PATTERNS OF COLLIMATOR BASED ON MODULATED METAL-DIELECTRIC SPIRAL STRUCTURE V. V. Goblyk, I. B. Subota, and O. M. Liske	281
7.	THE MATHEMATICAL MODELING OF RADIATION PATTERNS OF RECEIVING ANTENNAS ON TROPOSPHERIC PATHS O. L. Pavlova and V. A. Petrov.	282
8.	METHOD OF ELECTRODYNAMICAL ANALYSIS OF COMPLEX ANTENNAS SYSTEMS M. A. Buzova	285

MICROWAVE TECHNOLOGIES APPLICATION (MTA)

1.	POSSIBILITIES AND CHALLENGES OF MATERIAL PARAMETER EXTRACTION BY THZ TIME DOMAIN SPECTROSCOPY O. Y. Sushko, R. S. Donnan, R. F. Dubrovka, Bin Yang and K. Shala	291
2.	OPTOELECTRONIC TOOLS OF THE LABORATORY MICROWAVE EVALUATOR OF A COMPOSITION OF CRUDE OIL O. G. Morozov and R. R. Samigullin	297
3.	MICROWAVE MULTIFREQUENCY IMAGES OF ELECTRODYNAMICS OBJECTS HIDDEN BEHIND WALL V. Alekseev, O. Drobakhin, M. Drobakhina, G. Sherstyuk, and A. Zvegintsev	303
4.	ELECTROMAGNETIC STRUCTURES OF BEAM FORMING OF MICROWAVE MONITORING SYSTEM I. N. Prudyus, A. N. Zubkov, L. V. Lazko, and D. A. Mymrikov	306
5.	ACOUSTIC AERIAL FOR THE EXPERIMENTAL RESEARCH SODAR A. Yu. Panchenko, N. E. Alferov, and V. A. Maryuh	309
6.	SIMULATION OF MICROWAVE EXPOSURE OF HUMAN CELLS BY ELECTROMAGNETIC FIELD OF EMF BAND O. M. Dumin, O. O. Dumina, N. N. Kolchigin, D. D. Ivanchenko, Y. G. Shckorbatov, V. N. Pasiuga	312
7.	ANTENNA-RECTIFIER FOR POWER SUPPLY SUBSYSTEM OF LOW-SMALL SPACECRAFT D. V. Gretskih, A. V. Gomofov, V. M. Shokalo, Sh. F. A. Al-Sammarraie	315
8.	ADAPTIVE ANTENNA WITH CONTROL OF A SIGNAL ON THE STATION OF TROPOSPHERE COMMUNICATION V. I. Rudakov, A. Y. Gupalo, A. A. Kravchenko	318
9.	APPLICATION OF MICROWAVE TECHNOLOGIES FOR INCREASE OF EFFICIENCY OF POLYMERIC MATERIALS RECYCLING G. A. Morozov, O. G. Morozov, R. R. Samigullin, and A. R. Nasibullin	321
10.	OBJECT DETECTION BY PRECISION RADIOWAVE DEFECTOSCOPE BASED ON A SLOT RADIATOR WITH A USE OF ARTIFICIAL NEURAL NETWORK A. O. Melnychuk, R. M. Yakymiv, and O. M. Liske	324
11.	MARINE VIEWFINDER A. N. Nechiporenko, L. D. Fesenko, and B. M. Bulgakov	330

MICROWAVE COMPONENTS (MC)

1.	TOTAL TRANSMISSION THROUGH AN IRIS WITH WALL-TO-WALL STEPPED SLOT PLACED IN A RECTANGULAR WAVEGUIDE S. A. Prikolotin and A. A. Kirilenko	335
2.	POLARIZERS ON SECTIONS OF SQUARE WAVEGUIDES WITH INNER CORNER RIDGES L. A. Rud and K. S. Shpachenko	338
3.	FAST PARAMETER MEASUREMENTS FOR ANTENNA-FEEDER DEVICES V. F. Borulko and V. A. Karlov.	344
4.	ANALYSIS OF NATURAL FREQUENCY AND Q-FACTOR ESTIMATION FOR OPEN DIELECTRIC RESONATORS WITH VARIATION OF COUPLING BY MEANS OF FRACTIONAL-RATIONAL APPROXIMATION OF REFLECTION RESPONSE M. V. Andreev, O. O. Drobakhin, and D. Yu. Saltykov	347
5.	ANALYSIS OF H-SHAPED SLOT RESONATORS IN MICROSTRIP LINE GROUND PLANE FOR STOPBAND FILTER DESIGN Yu. V. Rassokhina and V. G. Krizhanovski	350
6.	DETERMINATION OF EIGENFREQUENCIES OF A RADOME WITH A SHAPED FORM S. P. Malashenkov, I. I. Anikiev, M. I. Mikhailova, and E. A. Suschenko	353

AUTHORS INDEX