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GENERAL DIFFRACTION AND SCATTERING 1972-1974 (EXCLUDING HIGH FR--ETC(U)
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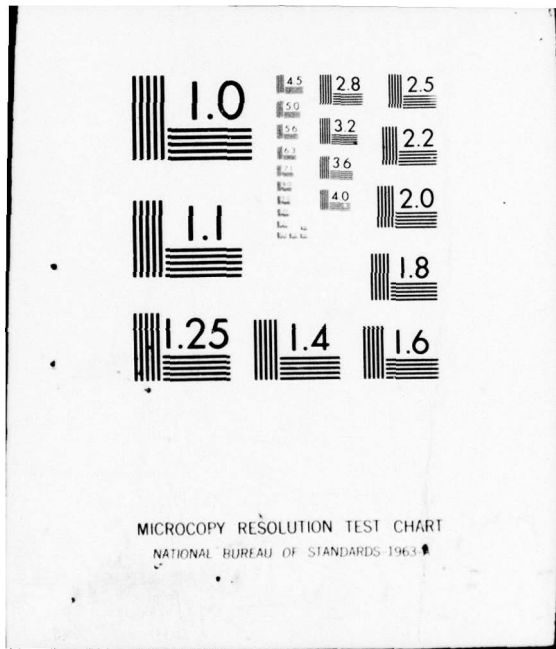
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General Diffraction and Scattering 1972-1974
(Excluding High Frequency Techniques, Transient
Electromagnetics and Numerical Methods)

Prepared for International Commission VI, URSI
Triennial Report
by
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Abstract:

The world's published research on general diffraction and scattering for the period 1972-1974 is reviewed as a part of the Triennial Report of International Commission VI, International Scientific Radio Union (URSI).

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A. D. Blose

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General Diffraction and Scattering 1972-1974
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Prepared for International Commission VI, URSI
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Interdisciplinary Interaction:

A few years ago, Mark Kac (1972) observed hopefully that physics and mathematics, then in a period of alienation were showing signs of a rapprochement. Activity in the area of General Diffraction and Scattering during the period 1972-1974 appears to support this optimistic view and increase the circle of rapprochees to include radio engineering.

Perhaps the most significant area of contact concerns the application to obstacle scattering problems of methods developed in quantum mechanical scattering. A detailed review of approximate methods in potential and particle scattering, including methods which have not yet been applied in electromagnetic scattering as well as those which have, was presented by Joachim and Quigg (1974). Methods which have found application in electromagnetics in this period include the use of symmetry groups (Barnt et al, 1973) WKB methods (Chakraborty, 1973), and a Volterra integral equation technique for solving the Lippman-Schwinger equation (Kouri, 1973).

The infusion of ideas developed in other disciplines also included applications of the extinction theorem in molecular optics (Pattanayak and Wolf, 1972), (Wolf, 1973) and analogies with elasticity (Peng, 1973). The method of matched asymptotic

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expansions and singular perturbations were applied to acoustic scattering (Lesser and Lewis, 1972a,b,1974) and variational methods found continued application in both acoustics and electromagnetics (Coen and Wexler, 1973) (Foster and Andersen, 1973). (Hazel and Wexler, 1972) (Kulikov, 1973) (Voytovich et al,1972). Reviews of acoustic diffraction theory were presented by Jones (1972) and Horton (1972) and an extensive bibliography of acoustic scattering was assembled by White and Sohn (1972).

Integral equation formulations have provided the basis for most of the analytical as well as numerical work in this period and underlie many of the investigations included here under other headings. Not mentioned elsewhere, however, is the work on Fredholm equations of the first kind of Belward (1974) and Kravtsov and Shatov (1973), Bojarski's (1972) K-space formulation of electromagnetic scattering, deJong's (1972a) formulation of piezoelectric diffraction problems, the surface integral equation formulations of Fawzi (1974) and Gruner et al (1974), and the treatment of far zone scattering given by Kul'ko and Mikhnova (1972).

Eigenvalues and Modal Expansions:

Because of the equivalence of the complex eigenvalues (decay rates) of the exterior problem and the poles of the resolvent in the integral equation formulation of the scattering problem, considerable understanding has been gained of the intimate connection between the transient problem whose solution may be represented in terms of the corresponding exterior eigenfunctions and the time harmonic problem whose solution may be represented in terms of the resolvent. The location and

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scattering geometry dependence of these poles will undoubtedly be the objects of research efforts for some time but considerable progress has been made in this period by Arsenev (1972), Beale (1973), Daboul and Jensen (1973), Goldstein (1974), Gulicher and Krasnushkin (1972), Lax and Phillips (1972a,b), Majda (1974), Marin and Latham (1972), Marin (1973, 1974a), Morawetz (1972), Ramm (1972), Shenk and Thoe (1972), Tesche (1973a,b) and Vaĭnberg (1972). The use of characteristic modes directly in electromagnetic scattering problems was treated by Harrington et al (1972), Nikol'skiy and Feoktistov (1972), Ramm (1973) and Zaboronkova and Kondrat'ev (1972).

Problems associated with eigenvalues of interior problems and their relevance to exterior scattering were also examined (Bolomey and Tabbara, 1973) (Jones, 1974) (Kleinman and Roach, 1974) (Leis, 1974) (Rogers, 1973b) (Shamma and Karp, 1972) (Tai and Shaw, 1974) (Ursell, 1973) and (Wirgin, 1973a).

Application of more general modes, not necessarily eigenfunctions associated with a particular scatterer, was made by Harrington and Mautz (1972a) and Mautz and Harrington (1973). The use of spherical harmonics in problems involving nonspherical scatterers, as exemplified in the "extended boundary condition" method (Waterman, 1971), continued to receive attention (Bates and Wong, 1973, 1974) (Bolomey and Wirgin, 1974) (Devaney and Wolf, 1973, 1974) (Eyges, 1973) (Hizal, 1973, 1974) (Hizal and Tosun, 1973) (Peterson and Ström, 1973, 1974a,b) (Ström, 1974). Reilly (1973) also used spherical harmonics for nonspherical scatterers but, in contrast to the above, did not assume convergence on the surface but matched coefficients on the smallest enclosing sphere. The question of convergence of expansions in spherical harmonics on nonspherical surfaces has apparently been resolved (Millar, 1973a) and conditions for the validity of expansions in terms of outgoing waves only, the Rayleigh criteria, have been provided (Bates et al, 1973) (Ikuno and Yasuura, 1973)

(Kozachek and Sachelko, 1974) (Landsberg, 1973) (Millar, 1973b). Related work took place on problems involving radiation conditions (Naylor, 1972) (Naylor et al, 1973) (Roach and Adams, 1972).

Gratings:

Use of the Rayleigh criteria in single body scattering does not mean that grating problems, which fostered a flourishing controversy over its validity, have been ignored. In addition to a review of grating problems (Petit and Maystre, 1972a) and the aforementioned work of Millar (1973a) on Rayleigh criteria, results have been obtained on sinusoidal gratings (Dailami et al, 1972) (Fang, 1972), Echelette gratings (Jovicevic and Sesnic, 1972), imperfectly as well as perfectly conducting gratings (Maystre, 1972, 1973) (Maystre and Petit, 1972b) (Neviere et al, 1973), double gratings (Blok and Mur, 1972) (Butenko and Litvinenko, 1972) gratings separating different media (Kitajuna, 1972) (Adonina et al, 1972) and gratings of strips (Kent and Lee, 1972), cylinders (Bezuglyi and Shestapalov, 1973), dielectric cylinders (Barkley et al, 1973), dielectric bars (Masalov and Repa, 1972) and cylinders of arbitrary cross section (Astapenko, 1972) (van den Berg and Voorman, 1972). The closely related problem of scattering by periodic arrays was also considered (Litvinenko and Oblyvach, 1972) (Kasanskii et al, 1974) (Kirilenko and Masalov, 1972a,b) (Solymer and Appel-Hansen, 1974) and arrays of wires also received attention (Otteni, 1973) (Wait 1972a,b) (Wilson, 1974).

Low Frequency Scattering:

An integral equation method was developed in scalar scattering which yields the unknown surface field as the limit of iterates of a surface integral operator for a wide class of scatterer geometry (Ahner and Kleinman, 1973). Extensions to piecewise homogeneous media were derived (Ahner, 1974) and a related formulation

in electromagnetics was discussed (Ormsby, 1974). Although limited to low frequencies, the technique differs essentially from standard low frequency expansions in that it apparently has a larger radius of convergence. Totally independent integral equation methods were developed to solve the two dimensional problem for cylinders of arbitrary cross section using conformal mapping by Hill et al, (1973) and Shafai, (1973a).

In the area of low frequency expansions, a method was derived for utilizing polarizability tensors which are independent of the incident field to determine the first (dipole) term in a Rayleigh series representation of the electromagnetic field scattered by a perfect conductor (Keller et al, 1972) (Kleinman and Senior, 1972) (Kleinman, 1973). Corresponding results in acoustic scattering were obtained by Senior (1973).

Similar results in scattering by small apertures were derived by Fikhnanas and Fridberg (1973a,b), Stepanyuk et al (1973) and van Bladel (1972). A circuit parameter interpretation of the first two terms in an expansion of the field scattered by small dielectric objects was given by van Bladel (1973) and the anisotropic case was considered by De Mey (1974).

Low frequency scattering results for particular configurations were obtained by Hill and Wait (1972,1973,1974) for spheres near the ground, cylinders and spheroids and by Love (1974) for a torus. Determination of the first (dipole) term is essentially an electrostatic potential problem and relevant results were obtained by Beluga (1972) for cylinders of arbitrary cross section, Fikioris (1973) for spheroids and Murashima (1973) for finite cylinders. Variational methods in electrostatics were treated by Kulikov (1972) and Kulikov and Levina (1972)

while the applications of probabilistic potential theory were discussed by Bevensee (1973).

Inverse Scattering:

Continued interest in the inverse scattering problem was evidenced in this period. An idea of various approaches may be obtained from the contributions collected by Colin (1972).

Pertinent work has been done for the wave equation (Kalaba and Zagustin, 1974) (Weston, 1972,1974) (Weston and Krueger, 1973), the Helmholtz equation (Sleeman, 1973), low frequency approximations (Boerner and Ahoul-Atta, 1973) (Hill, 1973) (Van den berghe and Boerner, 1972a,b), and high frequency approximations (Hamid and Mohsen, 1972) (Van den berghe and Boerner, 1972c) and (Tabbara, 1973). Perry (1974) considered high frequency methods via regularization techniques which were also discussed by Deschamps and Cabayan (1972). The role of impedance boundary conditions in inverse scattering was studied by Boerner and Ahluwalia (1972) and applied in particular cases by Ahluwalia and Boerner (1973,1974), Chaplin and Aksel'rod (1972) and Chebyshev (1972). Some numerical problems were treated by Cabayan et al (1973). Related work was done on inversion of molecular scattering data (Buck, 1974), discrete methods (Case, 1973) (Case and Chiu, 1973) (Case and Kac, 1973), one dimensional profile inversion (Jordan and Kritikos, 1973), and logarithmic potential scattering (Parasyuk et al, 1972). The purported exact solution of Bojarski (1973) merits study to determine its validity, limitations and applicability.

Waveguide Scattering:

Included in the vast literature on waveguides during this period is the usual complement of waveguide scattering problems. Integral equation methods predominated this work which includes scattering in dielectric loaded waveguides (Bates et al, 1972),

periodic dielectric loadings (perng, 1972), stepped guides (Kazakova and Percikov, 1972), dielectric steps (Royer and Mittra, 1972), slotted guides (Khadzhinov, 1972), guides with circular sections (Lapta and Sologub, 1973) (Zhurav and Loser, 1973), cylindrical obstacles in rectangular guides (de Jong, 1972b), elliptical guides and obstacles (Gal and Khizhnyak, 1972) (Laura, 1972) (Ukrainets and Khizhnyak, 1973), and planar waveguides (Fel'd et al, 1973) (Il'inskii and Galishnikova, 1973) and (Nefedov and Fialkovsky, 1972).

Moving Boundaries:

Electrodynamics of moving media has been an area of increasing activity over the past decade and this trend continued during the period 1972-74. One class of problems involves scattering of waves by the moving boundary between two half spaces with differing constitutive parameters and work in this area was reported by Censor (1972a), Hosono (1974), Ostrovskii (1972), Solimeno (1974a,b) and Yasumoto (1972). Inhomogeneous moving media were treated by Aivazyun and Megelyan (1973) and Tanaka and Hazama (1972).

Scattering by moving obstacles in a stationary medium was studied with increasing intensity with specific consideration of moving half planes (Candel, 1973), plates (Krasilshchikova, 1972), mirrors (Ollendorff, 1972), strips (Hunter, 1972a), spheres (Bhartia, 1974), cylinders (Censor, 1972b) (LeVine, 1973), (Hunter, 1973a,b), arbitrary small obstacles (Nerukh and Khizhnyak, 1973) (Petrov, 1972a, 1973), and plasma columns (Shiozawa and Seikai, 1972a,b).

Rotating systems were discussed (Petrov, 1972b) (Shiozawa, 1973) as were radially expanding systems (Censor, 1973) (Pogorzelski, 1973). Scattering from oscillating irregular planes also received attention (Borker and Yang, 1973) (Konrady, 1974).

Scattering by Specific Geometric Configurations:

Most of the long standing favorite geometries have not been neglected in this period. New candidates have appeared as the exact solutions for scattering by a strip (Wolf, 1972, 1973) and the dielectric wedge (Lantz, 1973).

Other treatments of the strip and complementary slit problem were presented by Guiraud (1973a,b) and Pimenov and Press (1973). New approximate solutions have appeared for narrow strips and slits (Lebedev and Skal'skaya, 1972) (Leeb, 1972), medium slits (Lin, 1972), slits in thick screens (Deryck, 1973) (Roumiguieres et al, 1973), slits in screens separating two media (Colombeau et al, 1973) (Facq and Robin, 1972) (Neerhoff and Mur, 1973), slits in an impedance plane (Hongo, 1972), slit formed by staggered parallel planes (Kashyap, 1974), and a rectangular groove in a metallic screen (Wirgin, 1973b).

Meixner (1972) examined the consequences of his edge condition at the edge of a dielectric wedge. Another edge condition study was made by Lang (1973b) at the common edge of a wedge and a resistive sheet. Scattering by dielectric loaded wedges was treated by Mohsen and Hamid (1973) and Towaij and Hamid (1974) while Bates (1973) considered both dielectric wedges and prisms.

Other problems involving cylindrical geometries which were reported included scattering from circular cylinders (Kosheroi and Mikhailovski, 1972), notched circular cylinders (Hunter, 1974), cylinders illuminated by Gaussian beams (Alexopoulos and Park, 1972), cylinders of varying cross section and constitutive material (Beloozerov and Dolgova, 1972) (Lioo, 1972) (Maystre and Vincent, 1972) (Shafai, 1973b) (Shafai and Bhartia, 1973a,b) (Vasil'ev and Solodukhov, 1973) (Yeh and Wang, 1972), coated cylinders (Fedele, 1973) (Kovner, 1973) (Sveshnikov et al, 1972) (Uslenghi, 1973), cylinders near an impedance surface

(Bombardt, 1973) (Shcherbitskiy, 1972), elliptic cylinders (Alexopoulos et al, 1974) (Kaufman et al, 1973) (Van den Berg and Van Schaik, 1973), polygonal cylinders (Hunter, 1972b), hollow semi-infinite cylinders (Lee et al, 1973), hollow finite cylinders (Lebedev and Skal'skaya, 1973) and cylinders in a piezoelectric medium (de Jong, 1972c).

In addition to the work on the edge condition cited above in connection with wedge problems, a careful study of edge conditions^{was} presented by Hayashi (1973) in his treatment of scattering from open surfaces, Fel'd (1973, 1974) and Ufimtsev (1974) also considered this problem. Radin and Shestopalov (1974) considered apertures on a sphere and Hunter and Bates (1972) examined small apertures (close edges) on perfect conductors. Edge diffraction in connection with scattering by a spherical cap was treated by Jain and Kanwal (1972) and a paraboloidal cap by James (1974), Rogers (1973a) and Watson and Ghobrial (1972).

The planar open surfaces, aperture in a plane screen and complementary disc, was the object of a number of scattering investigations. Half plane problems were treated by Hamid and Towaj (1972), Myshkin (1972) and Tan and Cheng (1972). Diffraction by arbitrarily shaped apertures was examined by Morita (1972) and thin plates were treated by Lin et al (1974) and Mittra et al (1973). Lit (1972) worked with the somewhat controversial boundary diffraction waves at the rim of an aperture and Tanaka et al (1972) studied aperture diffraction of beams. Scattering by a circular disc on the interface between different media received attention from Boersma (1972), Dmitriev et al (1973), and Lugovoi and Sologub (1973). A Babinet's Principle for a resistive aperture in a conducting screen was presented by Lang (1973a)

and criticized by Harrington and Mautz (1974). Scattering by a disc near an aperture was considered by Ivanov (1972) and Kuzmin (1972). Van Dueren (1972) analyzed scattering by a dielectric ring and Teague and Zitron (1972) treated an aperture between two wedges.

Other geometric shapes which were considered as scattering objects included the sphere (Inada, 1973) (Mandal, 1973), cone (Nikolaev, 1972), prolate spheroid (Gatkin et al, 1972), quarter plane (Satterwhite, 1974), straight line segment (Ranger, 1973, 1974), dielectric step (Mergelyan, 1972a), dielectric loaded corner reflector (Towaij et al, 1972), and V shaped wires (Lin, 1972). Shestopalov and Shcherbak (1972) treated obstacles which consisted of combinations of bodies for which the scattering properties were known. Ogawa and Fujioka (1972) examined scattering by the interface between two conducting media and Avetisyan (1972) treated dielectric bodies of revolution.

Multiple Scattering:

Two body scattering problems for spheres (Olaofe, 1974), spheroids (Van Buren and King, 1972), strips (Kanwal and Saçledeva, 1973), elliptical reflectors (Soejima and Shimada, 1973), discs (Marin, 1974b), and cylinders in an inhomogeneous medium (Pavlov, 1973a, b) all received attention during this period.

Twersky (1973) treated the three dimensional problem of a periodic line of identical obstacles and Leppington and Levine (1973) studied periodic apertures in a plane screen. Ramm (1974a, b) analyzed both scalar and electromagnetic scattering from collections of small bodies as did Peterson and Ström (1973, 1974a).

Two dimensional multiple scattering studies were carried out by Bezuglyi and Shestopalov (1972) for arrays of slotted circular cylinders, Howarth (1973)

Howarth and Pavlasek (1973) and Howarth et al (1974) for cylinders in a way which suppressed the single body scattering contribution, Kopaleishvili and Popovidi (1972a, b) for arbitrarily shaped cylinders at long wavelengths and Kyurkchan (1972) using an orthogonalization method to solve a system of integral equations for circular and elliptic cylinders.

Rough Surfaces:

Electromagnetic scattering by a rough surface was treated by O'Kelly and Kharadly (1972) while Bahar (1972a, b) considered rough impedance boundaries. The related acoustic problem for statistically rough surfaces was examined by De Santo (1974), Medwin and Hagy (1972), Welton (1973) and Zipfel (1974). Gardner (1973) considered backscattering at grazing incidence. Diffraction by a corrugated dielectric surface (Mergelyan, 1972b), a periodically corrugated surface (De Santo, 1973) and active corrugations (Lee, 1972) all received attention. Scattering by rough cylinders was also studied (Shah and Vardya, 1972) (Tong, 1974).

Inhomogeneities and Equivalent Boundary Conditions:

The effect of inhomogeneities, both in the constituent material of the scatterer and in the media in which the scatterer is immersed, has been the subject of a number of investigations. Spherically symmetric objects with radial inhomogeneities were examined by Semenov (1972) and Shafai (1972a), inhomogeneous shells by Alexopoulos (1972), and anisotropic as well as inhomogeneous objects by Okamoto and Yamada (1973). Cylindrically symmetric objects were treated by Neelakantaswamy et al (1973) and Shafai (1972b).

Inhomogeneous media were considered by Foster and Anderson (1973b), Hassab (1972), Permitin (1973) and Tikhonov et al (1973). Attempts to approximate inhomogeneous media with equivalent boundary conditions were made for plane interfaces (Agranovich and Yudson, 1973) (Eaves, 1972) (Wegrowicz, 1972) and non planar grids (Kantorovich, 1972). Impedance boundary conditions were treated by Gudovich et al (1973) while Harrington and Mautz (1972b) studied reactive loading.

Selected Books:

A publishing event of importance is the long awaited appearance of the book on radiation and scattering by Felsen and Marcuvitz (1973). Another book that merits attention of the scattering community, especially but not exclusively concerned with numerical methods, was edited by Mittra (1973).

Other books deserving mention are the collection of papers on wave propagation edited by Babich (1972), Monteath's (1973) work on reciprocity, the time dependent problems considered by Nussenzweig (1972), Stavroudis' (1972) work on optics, Tolstoy's (1973) work on wave propagation and the study of black body scattering by Zakhar'yev and Lemanskiy (1972).

Finally, a review of scattering and diffraction for this period would be incomplete without mention of the publication of the extended abstracts of papers presented at the 1974 URSI Symposium on Electromagnetic Wave Theory (URSI, 1974).

References

- Adonina, A.I., A.M. Andrusenko, V.M. Komolov and Yu T. Repa (1972), EM Wave diffraction on a grating placed at the interface of two dielectric layers, Radio Technika, Kharkov, 20, 172-178.
- Agranovich, V.M., V.F. Yudson (1973), Boundary conditions in media with spatial dispersion, Opt Comm, 7 (2), 121-124.
- Ahluwalia, H.P.S. and W. Boerner (1973), Application of a set of inverse boundary conditions to the profile characteristics inversion of conducting circular cylindrical shapes, IEEE Trans AP, 21, 663-672.
- Ahluwalia, H.P.S. and W. Boerner (1974), Application of Electromagnetic inverse boundary conditions to profile characteristics inversion of conducting spherical shapes, IEEE Trans AP, 22, 673-682.
- Ahner, J.F. (1974), Scattering by a hard obstacle in a piecewise homogeneous medium, ZAMP, 25, 541-546.
- Ahner, J.F. and R.E. Kleinman (1973), The exterior Neumann problem for the Helmholtz equation, Arch Rat Mech Anal, 52 (1), 26-43.
- Aivazyan, Yu. M. and O.S. Megelyan (1973), The diffraction of electromagnetic waves from moving periodically-non homogeneous media, IZR Akad Nauk Arm SSRFiz, 8 (3), 178-186.
- Alexopoulos, N.G. and V. Barcilon (1972), Reflection of light from an inhomogeneous shell, IEEE Trans AP, 20, 390-391.
- Alexopoulos, N.G. and P.K. Park (1972), Scattering of waves with normal amplitude distribution from cylinders, IEEE Trans AP, 20 (2), 216-217.
- Alexopoulos, N.G., G.A. Tadler and F.W. Schott (1974), Scattering from an elliptic cylinder loaded with an active or passive continuously variable surface impedance, IEEE Trans AP, 22 (1), 132-134.
- Arsenev, A.A. (1972), On the singularities of the analytic continuation and the resonance properties of a solution of the dispersion problem for the Helmholtz equation, Z. Vycisl. Mati Mat Fiz, 12, 112-138.
- Astapenko, V.M. (1972), An asymptotic solution to the problem of diffraction of a long planar electromagnetic wave by a grid of arbitrary profiles, Radio Eng & Electron Phys, 16 (9), 1453-1459.

- Avetisyan, A.A. (1972), Diffraction of Electromagnetic waves from uniform bodies of revolution with arbitrary complex dielectric constant, Radio Eng & Elect Phys 17 (4), 545-550.
- Babich, V.M. (1972), Mathematical Problems in Wave Propagation Theory Part III, Plenum Press, New York.
- Bahar, E. (1972a), Radio Wave Propagation Over A Rough Variable Impedance Boundary Part I - Full Wave Analysis, IEEE Trans AP, 20, 354-361.
- Bahar, E. (1972b), Radio Wave Propagation over a Rough Variable Impedance Boundary Part II-Applications of Full Wave Analysis, IEEE Trans AP, 20, 362-367.
- Barkley, L., B.A. Howarth, and T.J.F. Pavlašek (1973), Interactive focussing in a parallel planar array of dielectric cylinders, J. Opt Soc Am, 63 (6), 673-675.
- Barnt, A.O., M. Carmelli and S. Malin (1973), Scattering of electromagnetic radiation in terms of functions over the group SU2, Ann Phys, 77 (1-2), 452-453.
- Bates, R.H. T. (1973), Wavefunctions for prisms, Int. J. Electronics, 34 (1), 81-95.
- Bates, R.H.T., C. Eng and F.L. Ng (1972), Polarization source formulation of electromagnetism and dielectric-loaded waveguides, Proc. IEE, 119 (11), 1568-1574.
- Bates, R.H.T., J.R. James, I.N.L. Gallett and R.F. Millar (1973), An overview of point matching, The Radio and Electronic Engineer, 43 (3), 193-200.
- Bates, R.H. T. and C.T. Wong (1974), The extended boundary condition and thick axially symmetric antennas, Appl Sci Res, 29 (1), 19-43.
- Beale, J. Thomas (1973), Scattering Frequencies of Resonators, Comm Pure + Appl Math, 26, 549-563.
- Beloozerov, N.N. and I.I. Dolgova (1972), Diffraction of a Cylindrical Wave by a Cylindrical Shell of Arbitrary Cross-Section, Sov. Phys-Acoust, 17, 380-382.

- Beluga, I. Sh. (1972), Computation of a two dimensional electrostatic field of conductors of arbitrary cross-section, *Radio Eng + Electron Phys*, 17 (9), 1590-1593.
- Belward, J.A. (1974), On the Relationship of some Fredholm Integral Equations of the First Kind to a Family of Boundary Value Problems, *J. Math Anal + Applics*, 48, 184-199.
- Bevensee, R.M. (1973), Probabilistic Potential Theory Applied to Elect Eng Probs, *Proc IEEE*, 61 (4), 423-437.
- Bezuglyi, A.V. and V.P. Shestopalov (1972), Diffraction of a plane electromagnetic wave on lattices of circular cylinders with a spiral slot, *Radio Phys + Quant Electron*, 15 (12), 1885-1893.
- Bezuglyi, A.V. and V.P. Shestopalov (1973), Diffraction of a plane, electromagnetic wave at grating of cylinders with periodic spaces, *Radio Phys + Quantum Electron*, 16 (5), 12-19.
- Bhartia, P. (1974), Scattering of Electromagnetic Waves by an Imperfectly Conducting Sphere in Uniform Motion, *Int J. Electronics*, 37 (2), 251-255.
- Blok, H. and G. Mur (1972), Diffraction by a double grating, *Appl Sci Res*, 26, 389-397.
- Boerner, W.M. and H.P.S. Ahluwalia (1972), On a set of continuous wave electromagnetic inverse scattering boundary conditions, *Canad J. Phys.* 50 (23), 3023-3061.
- Boerner, W.M. and O.A. Aboul-Atta (1973), On a determinant associated with E.M. inverse scattering in spherical coordinates, *Utilitas Mathematica* 3, 163-237.
- Boersma, J. (1972), "Comments on EM diffraction by a circular disk between two different media" by D.L. Jain, *Appl Sci Res*, 26, 315-316.
- Bojarski, N.N. (1972), K-Space formulation of the electromagnetic scattering problem, Tech Report AFAL-TR-72-271, Air Force Avionics Lab.
- Bojarski, N.N. (1973), Inverse scattering, Final Report Contract N000 19-72-C-0462, Naval Air Systems Command.

- Bolomey, J. Ch. and W. Tabbara (1973), Numerical Aspects on coupling between complementary boundary value problems, IEEE Trans Antennas + Propagation AP, 21 (3), 356-363.
- Bolomey, J. Ch. and A. Wirgin (1974), Numerical comparison of the Green's function and the Waterman and Rayleigh theories of scattering from a cylinder with arbitrary cross-section, Proc IEE, 121 (8), 794-804.
- Bombardt, J.N., Jr. (1973), Time-harmonic induced current on a thin cylinder above a finitely conducting half plane, J. Appl. Phys., 44 (9), 4226-4228.
- Borkar, S.R. and R.F.H. Yang (1973), Scattering of electromagnetic waves from rough oscillating surfaces using spectral Fourier method, IEEE Trans AP, 21 (5), 734-736.
- Buck, U. (1974), Inversion of Molecular Scattering Data, Rev Mod Phys, 46 (2) 369-389.
- Butenko, N.S. and L.N. Litvinenko (1972), Longwave asymptotic analysis of diffraction on a two-element grating, Radiotekhnika Kharkov, 20, 79-85.
- Cabayan, H.S., R.C. Murphy, and T.J.F. Pavlaček (1973), Numerical Stability and Near Field Reconstruction, IEEE Trans AP, 21, 346-351.
- Candel, S.M. (1973), Diffraction of a plane wave by a half plane in a subsonic and supersonic medium, J. Acoust Soc Amer, 54, 10008-1016.
- Case, K.M. and S.C. Chiu (1973), The Discrete Version of the Marchenko Equations in the Inverse Scattering Problem, J. Math Phys, 14, 1643-1647.
- Case, K.M. and Kac, M. (1973), A discrete version of the inverse scattering problem, J. Math Phys., 14, 594-603.
- Case, K.M. (1973), On Discrete Inverse Scattering Problems, J. Math Phys, 14, 916-920.
- Censor, D. (1972a), Scattering in velocity-dependent systems, Radio Sci, 7, (2), 331-337.
- Censor, D. (1972b), Velocity dependent multiple scattering by two thin cylinders, Radio Sci, 7 (10), 949-954.

- Censor, D. (1973), Scattering from expanding systems, Israel J. Technol, 11 (3), 109-115.
- Chakraborty, B. (1973), The mathematical problem of reflection solved by an extension of the WKB Method, J. Math Phys, 14 (2), 188-190.
- Chaplin, A.F. and A.M. Aksel'rod (1972), Inverse Problem of Diffraction for a Reactance Plane, Radiophys and Quant Electron, 15, (2), 1905-1912.
- Chebyshev, V.V. (1972), Inverse Electrodynamic Problem for An Asymmetric Excited Impedance Cylinder (in Russian) Gor'kiy, Izv. Vyss. Ucheb. Zaved., Radiofiz, 15, 1407-1416.
- Coen, S. and A. Wexler (1973), Comments on "Variational formulations of the Dirichlet Boundary condition", IEEE Trans MTT, 21 (9), 597-598.
- Colin. L. (ed) (1972) Mathematics of Profile Inversion NASA Tech Memo X62150.
- Colombeau, B., P. Faq and J. Du Marache (1973), Numerical Study of diffraction by a slit at the interface of two dielectric media, Opt Acta, 20 (12), 917-924.
- Daboul, J. and J.H.D. Jensen (1973), Electromagnetic Scattering as a Radiation Reaction Problem, Z. Phys. 265 (5), 479-486.
- Dailami, V.J., R. Mittra, and T. Itoh (1972), Comparative Study of the Rayleigh Hypothesis and Analytic Continuation Methods as Applied to Sinosoidal Gratings, IEEE Trans AP, 20, 392-394.
- De Jong, G. (1972a), Integral Equation formulation of piezo-electric diffraction problems, Appl. Sci. Res., 26, 445-474.
- De Jong G. (1972b), Scattering by a perfectly conducting cylindrical obstacle in a rectangular waveguide, Int J. Electronics, 32, 153-167.
- De Jong G. (1972c), Diffraction effects from cylindrical transducers in a piezo-electric medium of hexagonal symmetry (class C6V (6mm)), Appl Sci Res, 27, 169-218.
- De Mey, G. (1974) An expansion method for calculation of low-frequency Hall effect and magneto-resistance, The Radio and Electronic Engineer, 44 (6), 321-325.

- Deryck, L. (1973), Diffraction of a spherical wave by a slit in a thick conducting screen, Atti Fondi Giorgio Ronchi + Contrib Ist Naz Ottica, 28 (4), 523-544.
- De Santo, J.A. (1973), Scattering from a periodic corrugated surface; semi infinite alternately filled plates, J. Acoust Soc Am, 53, 719-734.
- De Santo, J.A. (1974), Green's function for electromagnetic scattering from a random rough surface, J. Math. Phys, 15 (3), 283-288.
- Deschamps, G.A. and H.S. Cabayan (1972), Antenna Synthesis and Solution of Inverse Problems by Regularization Methods, IEEE Trans AP, 20, 268-274.
- Devaney, A.J. and E. Wolf (1973), Representations for Multipole Moments and Angular Spectrum Amplitudes of Electromagnetic Fields, Optics Commun, 9, 327-330.
- Devaney, A.J. and E. Wolf (1974) Multipole expansions and plane wave representations of the electromagnetic field, J. Math. Phys., 15 (2) 234-244.
- Dimitriev, V.I., E.V. Zakharov and Ya-Ya Kokin (1973), Diffraction of electromagnetic waves at an ideally conducting disc immersed in a laminated medium, Vychisl. Metody and Program, 20, 220-229.
- Eaves, R.E. (1972), Electromagnetic boundary conditions for laminar regions, J. Phys. D. 5 (12), 2145-2151.
- Eyges, L. (1973), Solution of Schrödinger and Related Equations for Irregular and Composite Regions, Annals of Phys, 81 (2), 567-590.
- Facq, P. and G. Robin (1972), Diffraction by a slit of the interface between two isotropic dielectric media, Opt Commun, 6 (4), 410-414.
- Fang, D.J. (1972), Scattering from a Perfectly Conducting Sinusoidal Surface, IEEE Trans AP, 20 (3), 388-389.
- Fawzi, T.H. (1974), Use of surface integral equations for analysis of TM induction problem, Proc. IEE, 121 (10), 1109-1116.
- Fedele, J.B. (1973), Resonant Scattering from a conducting cylinder clad with an anisotropic plasma, IEEE Trans AP, 21 (6), 818-826.

- Fel'd, Ya. N. (1973), Diffraction of a scalar wave on a nonclosed surface with a Dirichlet boundary condition, *Sov. Phys-Dokl*, 17 (10), 979-980.
- Fel'd, Ya. N. (1974), Diffraction of electromagnetic waves by non-closed screens, *Sov Phys-Dokl*, 18 (9), 606-607.
- Fel'd, Ya. N., G.A. Svistunov, A.G. Kyurkchan and A.S. Leont'ev, (1973), Electromagnetic Wave Diffraction by a finite Plane-Parallel Waveguide System, *Radio Eng & Electron Phys*, 18 (5), 655-663.
- Felsen, L.B. and N. Marcuvitz, (1973), *Radiation and Scattering of Waves*, Prentice Hall, Englewood Cliffs, N.J.
- Fikhmanas, R.F., and B. Sh. Fridberg (1973a), Theory of diffraction at small apertures: Upper and lower variational estimates of integral scattering characteristics, *Radio Eng and Electron Phys*, 18 (5), 664.
- Fikhmanas, R.F. and P. Sh. Fridberg (1973b), Theory of diffraction at small apertures: Computation of upper and lower bounds of the polarizability coefficients, *Radio Eng and Electron Phys*, 18 (6), 824-829.
- Fikioris, J.G. (1973), On the boundary value problem of a spheroid, *Q. Appl Math*, 31 (1), 143-146.
- Foster, K. and R. Anderson (1973a), Approximate solutions for a class of electromagnetic problems, *Int J. Electron*, 35 (1), 137-140.
- Foster, K. and R. Anderson (1973b), Approximate Closed Form Solutions for Two-Dimensional Magnetostatic Problems, *Int J. Electron*, 34 (6), 849-851.

- Gal, L.K., and N.A. Khyzhayak (1972), E.M. scattering on a thin elliptical rod in a waveguide, *Radio Tekhnika Kharkov*, 20, 89-103.
- Gardner, R.R. (1973), Acoustic backscattering from a rough surface at extremely low grazing angles, *J. Acoust Soc Amer*, 53, 848-859.
- Gatkin, N.G., S.N. Paramonova and V.M. P'yanov (1972), Sound scattering by rigid prolate spheroids, *Sov Phys Acoust*, 17, 313-318.
- Goldstein, C.I. (1974), Scattering theory for elliptic differential operators in unbounded domains. I, *J. Math Anal & Applics*, 45, 723-745.
- Golichev, I.I., and P.E. Krasnushkin (1972), Spectral-source-like expansions in the theory of wave propagation and the quantum theory of potential scattering, *Theor and Math Phys*, 10(3), 250-263.
- Grüner, K., A. Schrott and V. Stein (1974), Computation of the diffracted and scattered fields of complex structures applying the integral equation method, *AEÜ*, 28, 506-509.
- Gudovich, I.S., S.G. Krein and I.M. Kulikov (1973), Boundary value problems for Maxwell's Equations, *Sov Phys Dokl*, 17, (11), 1053-1055.
- Guiraud, J.L (1973a), Energy propagation lines in the diffraction of an electromagnetic wave by a conducting band, *C.R. Hebd Seances Acad Sci B*, 276 (23), 847-850.
- Guiraud, J.L (1973b), Energy propagation lines in the diffraction of a plane e.m. wave by a slit in a plane conductor, *C. R. Hebd Seances Acad Sci B*, 277 (4), 103-106.
- Hamid, M.A.K., and A. Mohsen (1972), Inverse scattering by ray optics, *Int. J. Electronics*, 32 (1), 65-67.
- Hamid, M.A.K., and S.J. Towaij (1972), Diffraction by a half plane with a cylindrical dielectric cap, *IEEE Trans. AP*, 20, 663-665.
- Harrington, R.F., and Joseph R. Mautz (1972a), Green's functions for surfaces of revolution, *Radio Sci*, 7(5), 603-611.
- Harrington, R.F., and J.R. Mautz (1972b), Control of radar scattering by reactive loading, *IEEE Trans. AP*, 20, 446-454.
- Harrington, R.F., and J.R. Mautz (1974), Comments on "Babinet's Principle for a perfectly conducting screen with aperture covered by resistive sheet", *IEEE Trans. AP*, 22, 842.

- Harrington, R.F., J.R. Mautz, Y. Chang (1972), Characteristic modes for dielectric and magnetic bodies, IEEE Trans. AP, 20, 194-198.
- Hassab, J.C. (1972), Perturbational solution of the Helmholtz Equation in arbitrary inhomogeneous media, IEEE Trans. AP, 20, 524-525.
- Hayashi, Y. (1973), The Dirichlet problem for the two-dimensional Helmholtz Equation for an open boundary, Journ. of Math. Anal and Appl., 44, 489-530.
- Häzel, T.G., and A. Wexler (1972), Variational formulation of the Dirichlet boundary condition, IEEE Trans. MTT, 20, 385-390.
- Hill, D.A. (1973), Inverse scattering from a perfectly conducting prolate spheroid in the quasi-static domain, Canad J Phys, 51 (2), 219-222
- Hill, D.A. and J.R. Wait (1972), EM scattering of a small spherical obstacle near the ground, Canad J Phys, 50 (3), 237-243.
- Hill, D.A. and J.R. Wait (1973), Perturbation of magnetic dipole field by a finitely conducting circular cylinder, Rivista Italiana di Geofisica, XXII (5-6), 421-424.
- Hill, D.A., and J.R. Wait (1974), Perturbation of magnetic dipole fields by a perfectly conducting prolate spheroid, Radio Science, 9 (1), 71-73.
- Hill, R.N., R.E. Kleinman, and E.W. Pfaff (1973), Convergent long wavelength expansion method for two-dimensional scattering problems, Canad J. Phys, 51 (14), 1541-1564.
- Hizal, A. (1973), Scattering by perfectly conducting rotational bodies of arbitrary form excited by an obliquely incident plane wave or by a linear antenna, Proc IEEE, 120 (2), 181-182.
- Hizal, A. (1974), Formulation of scattering from conducting bodies of revolution as an initial value problem, J Phys D, 7 (2), 248-56.
- Hizal, A., and H. Tasun (1973), State-space formulation of scattering with application to spherically symmetrical objects, Can J Phys, 51 (5), 549-558.
- Hongo, K. (1972), Diffraction of electromagnetic plane wave by an infinite slit in a screen with surface impedance, IEEE Trans AP, 20, 84-86.
- Horton, C.W. Sr. (1972), Review of reverberation, scattering and echo structure, J Acoust Soc Amer, 51, 1049-1061.
- Hosono, T., (1974), Some problems in electrodynamics of moving media, Elect and Commun in Japan, 57-B-(1), 93-101.

- Howarth, B.A. (1973), Multiple scattering resonances between parallel conducting cylinders, *Canad J Phys*, 51 (23), 2415-2427.
- Howarth, B.A., and T.J.F. Pavlašek (1973), Multipole induction: A novel formulation of multiple scattering of scalar waves, *J. Appl. Phys*, 44 (3), 1162-1167.
- Howarth, B.A., T.J.F. Pavlašek, P. Silvester (1974), A graphical representation for interpreting scalar wave multiple scattering phenomena, *J. Comput Phys*, 15 (2), 266-285.
- Hunter, J.D. (1972a), High-frequency diffraction by a moving conducting strip, *IEEE Trans. AP*, 20, 792-794.
- Hunter, J.D. (1972b), Surface current density on perfectly conducting polygonal cylinders, *Canad J. Phys*, 50, 139-150.
- Hunter, J.D. (1973a), EM scattering by a transversely moving conducting cylinder of arbitrary cross-section, *Canad J. Phys*, 51, 699-706.
- Hunter, J.D. (1973b), Electromagnetic scattering by a moving conducting cylinder of arbitrary cross section, *Canad J. Phys*, 51 (22), 2389-2394.
- Hunter, J.D. (1974), Scattering by conducting notched and wedged circular cylinders, *Int. J. Electron.* 36 (3), 375-381.
- Hunter, J.D., and R.H.T. Bates (1972), Secondary diffraction from close edges on perfectly conducting bodies, *Int. J. Electronics*, 32, 321-333.
- Ikuno, H., and K. Yasuura (1973), Improved point matching method with application to scattering from a periodic surface, *IEEE Trans. AP*, 21 (5), 657-662.
- Il'inskii, A.S., and T.N. Galishnikova (1973), Investigating diffraction in waveguide by the Fredholm integral equation method, *Vychis Metody and Program*, 20, 22-37.
- Inada, H. (1973), New calculation of surface wave contributions associated with Mie backscattering, *Appl Opt.*, 12 (7), 1516-1523.
- Ivanov, E.A. (1972), On the solution of the problem of the diffraction of a dipole field by a circular aperture in a plane screen in the presence of a coaxial circular disc, *Differencial'nye UraVnenija*, 8, 1307-1308.
- Jain, D.L., and R.P. Kanwal (1972), Acoustic diffraction by a rigid annular spherical cap, *J. Appl. Mech*, 39, 139-147.
- James, G.L. (1974), Edge diffraction at a curved screen, *Electron Lett*, 10 (4), 167-168.

- Joachain, C.J., and C. Quigg (1974), Multiple scattering expansions in several particle dynamics, *Rev Mod Phys*, 42, (2), 279-324.
- Jones, D.S. (1972), Diffraction theory, a brief introductory review, *J. Sound Vibration*, 20, 71-78.
- Jones, D.S. (1974), Integral equations for the exterior acoustic problem, *Quart J. of Mech and Appl Math.*, XXVII (1), 129-142.
- Jordan, A.K., and H.N. Kritikos (1973), An application of one dimensional inverse-scattering theory for inhomogeneous regions, *IEEE Trans.* AP,21(6), 909-911.
- Jovievic, S., and S. Sesnic (1972), Diffraction of a parallel and perpendicular-polarized wave from an echelette grating, *J. Opt Soc Amer*, 62, 865-877.
- Kac, M. (1972), On applying mathematics: reflections and examples, *Quart Appl Math*, 30, 17-29.
- Kalaba, R., and E. Zagustin (1974), An initial value method for an inverse problem in wave propagation, *J. Math Phys*, 15(3), 289-290.
- Kanwal, R.P., and B.K. Sacledeva (1973), Approximate solutions of certain integral equations for the diffraction by two strips, *Z Angew Math and Phys*, 24 (1), 111-119.
- Kasanskii, V.B., N.N. Kolchigin and V.I. Ukrainets (1974), Diffraction of electromagnetic waves on multi-element arrays (the case of oblique incidence), *Radio phys and Quantum Electron*, 17 (7), 1058-1061.
- Kashyap, S.C. (1974), Diffraction characteristics of a slit formed by two staggered parallel planes, *J. Math Phys*, 15 (11), 1944-1949.
- Kaufman, A.A., L.A. Taborovskiy, and S.A. Tarent'yev (1973), Electromagnetic field of a plane wave in a medium containing an elliptical cylinder, *Siberian Dept. USSR Acad of Sci; Novosibersk, Geologiya i Geofizika*.
- Kazakova, N.A. and M.V. Percikov (1972), Scattering of waves at a step in a circular multiwave waveguide, *Radio Eng and Electron, Phys*, 17 (8), 1239-45.
- Keller, J.B., R.E. Kleinman., T.B.A. Senior (1972), Dipole moments in Rayleigh scattering, *J. Inst Maths Applics*, 9, 14-22.
- Kent, W.H., and S.W. Lee (1972), Diffraction by an infinite array of parallel strips, *J. Math Phys*, 13 (12), 1926-1930.
- Khadzhinov, V.D. (1972), Diffraction of E-polarized plane waves on an infinitely thin longitudinally-slotted cylindrical waveguide with a coaxial metal inner conductor, *Radiotekhnika, Kharkov*, 20, 109-115.
- Kirilenko, A.A., and S.A. Masalov (1972a), Diffraction of H-polarized waves by a tape array of the 'louver' type, *Radio Phys Quant Electron*, 15 (1), 61-71.

- Kirilenko, A.A., and S.A. Masalov (1972b), Diffraction of H-polarized waves on a tape array of the Jalousie type, *Radio Phys and Quantum Electron*, 15 (1), 83-97.
- Kitajima, H. (1972), On scattering of the plane waves by an infinite plane grating on anisotropic medium, *Bull Kyushu Inst Technol*, 25, 1-6.
- Kleinman, R.E. (1973), Dipole moments and near field potentials, *Appl Sci Res*, 27, 335-340.
- Kleinman, R.E., and G.F. Roach (1974), Boundary integral equations for the three-dimensional Helmholtz equation, *SIAM Review*, 16 (2), 214-236.
- Kleinman, R.E., and T.B.A. Senior (1972), Rayleigh scattering cross sections, *Radio Sci.*, 7 (10), 937-942.
- Konrady, J.A. Jr., (1974), Scattering of sound from time-varying irregular free surfaces, *J. Acoust Soc Am.*, 56 (16), 1687-1694.
- Kontorovich, M.I. (1972), Averaged boundary conditions for a grid consisting of non parallel and non rectilinear conductors placed on a non plane surface, *Radio Eng and Electron Phys.*, 17 (6), 902-910.
- Kopaleishvili, V.P., and R.S. Popovidi (1972a), Diffraction from objects of infinite length, *Radio Eng and Electron Phys*, 17 (7), 1074-1080.
- Kopaleishvili, V.P., and R.S. Popovidi (1972b), Diffraction from a finite system of cylinders, *Radio Eng and Electron Phys*, 17 (11), 1952-1956.
- Kouri, D.J. (1973), On the noniterative solution of integral equations for scattering of electromagnetic waves, *J. Math Phys*, 14, 1116-1120.
- Kovner, A. S. (1973), Diffraction of an electromagnetic wave by a metal cylinder surrounded by a plasma layer, *Radio Phys and Quantum Electron*, 16 (8), 1253-1259.
- Kozachek, V.V., and V.D. Sachelko (1974), Asymptotics of the scattering matrix in the problem of diffraction by an elliptic cylinder, *Vestnik Leningrad University*, 1, 100-104.
- Krasilshchikova, F.A. (1972), Acoustic wave diffraction on moving and stationary plate, *Proc Acad Sci USSR*, 203 (2), 311-314.
- Kravtsov, V.V., and A.K. Shatov (1973), Fredholm integral equations of the first kind applied to the solution of diffraction problems, *Vychisl Metody and Program*, 20, 134-143.

- Kulikov, E.L. (1972), A variation method for solving boundary value problems in electrostatics, Radio Eng and Electron Phys, 17 (9), 1590.
- Kulikov, E.L. (1973), Variational methods of solving problems in diffraction theory, Radio Eng and Electron Phys, 17 (12), 2005-2009.
- Kulikov, E.L., and N.N. Levina (1972), Contribution to the variational methods of calculation of boundary value problems in electrodynamics which can be reduced to static problems, Radio Eng and Electron Phys, 72, 1549.
- Kul'ko, V.F., and M.S. Mikhnova (1972), Calculation of EM wave diffraction fields at ideally conducting bodies in far zones and bright spot zones, OTBORI Pere DACHAINFORM, 32, 3-6.
- Kushevoi, V.V., and V.N. Mikhailovski (1972), Diffraction of a plane acoustic wave by a solid circular cylinder, OTBORI Pere DACHAINFORM, 33, 27-36.
- Kuzmin, Yu N, (1972), Electrostatic field of a circular disk near a plane containing an aperture, Sov Phys-Tech Phys, 17 (3), 473-476.
- Kyurkchan, A.G. (1972), Method of orthogonalization in problems of diffraction from several bodies, Radio Eng and Electron Phys, 17 (4), 534-545.
- Landsberg, I.L. (1973), The effects of converging waves in solving the problem of diffraction for a bounded body, Radio Phys and Quantum Electron, 16 (6), 927-935.
- Lang, K.C. (1973a), Babinet's Principle for a perfectly conducting screen with aperture covered by resistive sheet, IEEE Trans. AP, 21, 738-739.
- Lang, K.C. (1973b), Edge condition of a perfectly conducting wedge with its exterior region divided by a resistive sheet, IEEE Trans. AP, 21, 237-238.
- Lapta, S.I., and V.G. Sologub (1973), Scattering of a dipole field by a short section of circular waveguide, Radio Phys and Quantum Electron, 16 (10), 1588-1598.
- Latz, Norbert (1973), Electromagnetic diffraction by imperfectly dielectric wedges, J. Math Anal and Applics, 43, 373-387.
- Laura, P.A. (1972), Solution of Helmholtz equation in elliptical domains, IEEE Trans., MIT-20, 292.
- Lax, P.D., and R.S. Philips (1972a), On the scattering frequencies of the Laplace operator for exterior domains, Comm Pure and Appl Math, 25, 85-101.
- Lax, P.D., and R.S. Philips (1972b), Scattering theory for the acoustic equation in an even number of space dimensions, Indiana Math J., 27, 101-134.
- Lebedev, N.N., and I.P. Skal'skaya (1972), Dual integral equations and diffraction of electromagnetic waves by a thin conducting strip, Zh. Tekh Fiz, 42 (4), 681-90.

- Lebedev, N.N., and I.P. Skal'skaya (1973), Application of dual integral equations to the electrostatic problem of a hollow conducting cylinder of finite length, *Sov Phys-Tech Phys*, 18 (1), 28-32.
- Lec, S.W. (1972), Electromagnetic wave scattering from an active corrugated structure, *J Appl Phys*, 43, 388-96.
- Lee, S.W., V. Jamnejad., and R. Mittra (1973), Near field scattering by a hollow semi-infinite cylinder and its application to sensor booms, *IEEE Trans.* AP-21, 182-188.
- Leeb, W. (1973), Diffraction by narrow slits, *Appl. Optics.*, 12, 2806-2807.
- Leis, R. (1974), Boundary and eigenvalue problems in the theory of electromagnetic oscillations, *ZAMM*, 54(4), 36-40.
- Leppington, F.G., and H. Levine (1973), Reflexion and transmission at a plane screen with periodically arranged circular or elliptical apertures, *J. Fluid Mech*, 61, 109-177.
- Lesser, M.B., and J.A. Lewis (1972a), Applics of matched asymptotic expansion methods to acoustics I, The Webster horn equation and stepped duct, *J. Acoust Soc Amer*, 51, 1664-1669.
- Lesser, M.B., and J.A. Lewis (1972b), Applics of matched asymptotic expansions to accoustics II, The open-ended duct, *J. Acoust Soc Amer*, 52, 1406-1410.
- Lesser, M.B., and J.A. Lewis (1974), The acoustic cavity containing small scatterers as a singular perturbation problem, *J. of Sound and Vibration*, 33 (1), 13-27.
- LeVine, D.M. (1973), Scattering from a moving cylinder: oblique incidence, *Radio Sci*, 8, 497-504.
- Lin, B.J. (1972), Electromagnetic near field diffraction of a medium slit, *J. Opt. Soc. Amer*, 62 (8), 976-981.
- Lin, J.-Lu (1972), Backscattering from a V-shaped wire, *IEEE Trans.*, AP-20, 519-520.
- Lin, Juang-Lu., W.L. Curtis., and M.C. Vincent (1974), On the field distribution of an aperture, *IEEE Trans.*, AP-22 (3), 467-71.
- Liou, Kuo-Nam (1972), Electromagnetic scattering by arbitrarily oriented in cylinders, *Appl Opt* 11 (3), 667-674.
- Lit, J.W.Y. (1972), Boundary-diffraction waves due to a general point source and their applications to aperture systems, *Opt. Acta*, 19, 1007-1014.
- Litvinenko, L.N., and S.A. Oblyvach (1972), Diffraction of an E.M. Wave on an array of complex shape (in Russian), *Radio Tekhnika Resp. Mezhved. Temat. Nauck. Tekhn. SB*, 20, 71-79.

- Love, J.D. (1974), Long wavelength, acoustic scattering by a torus of arbitrary aspect ratio, *J Inst Maths Applics*, 13, 321-344.
- Lugovoi, A.V., and V.G. Sologub (1973), Scattering of electromagnetic waves by a disk at the interface between two media, *Sov Phys - Tech Phys*, 18 (3), 427-29.
- Majda, Andrew (1974), Outgoing solutions for perturbations of Δ with applications to spectral and scattering theory, *J of Diff Eq*, 16, 515-547.
- Mandal, B.N. (1973), Diffraction of waves by a two-part sphere, *Indian J Pure and Appl Math*, 4(5-6), 533-44.
- Marin, L., and R.W. Latham (1972), Representation of transient scattered fields in terms of free oscillations of bodies, *Proc IEEE*, 60, 640.
- Marin, L. (1973) Natural-mode representation of transient scattered fields, *IEEE Trans. AP-21*, 809-818.
- Marin, L. (1974a), Natural-mode representation of transient scattering from rotationally symmetric bodies, *IEEE Trans. AP-22*, 266-274.
- Marin, L. (1974b), Electromagnetic scattering from two circular disks, *J. Math Phys.*, 15 (9), 1603-13.
- Masalov, S.A., and ^{Yu.}T. Repa (1972), Wave diffraction on an array of rectangular dielectric bars, *Radiotekhnika Resp MezhvedTemat Nauck Tekhn* 5B 20, 116-127.
- Mautz, J.R., and R.F. Harrington (1973), Modal analysis of loaded N-port scatterers, *IEEE Trans. AP-21* (2), 188-99.
- Maystre, D. (1972), On the diffraction of a plane wave by a finite conductivity grating, *Opt Commun*, 6 (1), 50-54.
- Maystre, D. (1973), On the diffraction of a plane electromagnetic wave by a metal grating, *Opt Commun*, 8 (3), 216-19.
- Maystre, D. and R. Petit (1972), Diffraction by lamellar and perfectly conducting gratings, *Optics Communications*, 5 (2), 90-93.
- Maystre, D., and P. Vincent (1972), Diffraction of a plane electromagnetic wave by a cylindrical object of arbitrary cross section and finite conductivity, *Opt Commun*, 5 (5), 327-30.
- Medwin, H., and J.D. Hagy (1972), Helmholtz-Kirchhoff theory for sound transmission through a statistically rough plane interface between dissimilar fluids, *J Acoust Soc Amer*, 51, 1083-1090.
- Meixner, J., (1972), The behavior of electromagnetic fields at edges, *IEEE Trans*, AP-20, 442-446.

- Mergelyan, O.S., (1972a), The scattering of a plane wave on a dielectric step, *Izv. Akad Nauk Arm SSR Fiz*, 7 (4), 243-7.
- Mergelyan, O.S., (1972b), Diffraction of a plane electromagnetic wave on a dielectric corrugated surface, *Radio Phys and Quantum Electron*, 15 (8), 1233-38.
- Millar, R.F., (1973a), The Rayleigh hypothesis and a related least squares solution to scattering problems for periodic surfaces and other scatterers, *Radio Science*, 8, 785-796.
- Millar, R.F., (1973b), Singularities of solutions to linear, second order, analytic elliptic equations in two independent variables, II, *Applicable Analysis*, 2, 301-320.
- Mitra, R., Ed., (1973), *Computer Techniques for Electromagnetics*, Pergamon Press, Oxford
- Mitra, R., and Y. Rahmat-Samii., and D.V. Jamnejed., and W.A. Davis (1973), A new look at the thin plate scattering problem, *Radio Science*, 8 (6), 869-75.
- Mohsen, A., and M.A.K. Hamid (1973), Diffraction by a dielectric-loaded wedge, *Radio Sci*, 8 (1), 71-80.
- Monteath, G.D. (1973), *Applications of the electromagnetic reciprocity principle*, Pergamon Press, Oxford.
- Morawetz, C.S. (1972) On the modes of decay for the wave equation in the exterior of a reflecting body, *Proc Royal Irish Acad*, 72A, (9).
- Morita, N. (1972), Diffraction of electromagnetic waves by a two dimensional aperture with arbitrary cross-sectional shape, *Electron and Commun Jap*, 54 (5), 58-61.
- Murashima, S. (1973), Neumann functions for Laplace's equation for a circular cylinder of finite length, *Jap J Appl Phys*, 12 (8), 1232-43.
- Myshkin, V.G. (1972), Three dimensional diffraction problems for plane semi-infinite impedance systems, *Radio Phys and Quantum Electron*, 15 (6), 935-39.
- Naylor, D. (1972), On an integral transform associated with a condition of radiation, *Proc Comb Phil Soc*, 71, 369-379.
- Naylor, D., F.C. Choo and D.W. Barclay (1973), On an eigenfunction expansion associated with a condition of radiation II, *Proc Comb Phil Soc*, 74, 485-96.

- Neelakantaswamy, P.S., D.K. Banerjee, and T. Parthasarathy (1973), Modified radar cross section of a dielectric cylinder with conducting circumferential looploading, *AEÜ* 27, 192.
- Neerhoff, F.L., and G. Mur (1973), Diffraction of a plane electromagnetic wave by a slit in a thick screen placed between two different media, *Appl Sci Res*, 28, 73-80.
- Nefedov, Ye.I., and A.T. Fialkovsky (1972), Diffraction of plane electromagnetic wave at anisotropic half space in free space and in planar waveguide, *Radio Eng and Electron Phys*, 17 (6), 887-96.
- Nerukh, A. G., and N.A. Khizhnyak (1973), An integral form of Maxwell's equations in wave scattering by moving media, *Sov Phys - Tech Phys*, 18 (6), 711-15.
- Neviere, M., M. Cadilhac and R. Petit (1973), Applications of conformal mapping to the diffraction of E.M. waves by a grating, *IEEE Trans. AP-21*, 37-46.
- Nikolaev, B.G. (1972), The wave processes that arise in the diffraction on an ideally reflecting cone in the axially symmetrical case, *Zap. Nauč. Sem Leningrad. Otdel Mat Inst Steklov (LOMI)* 25, 151-171.
- Nikolskiy, V.V., and V.G. Feoktistov (1972), Expansion of the field into the eigenfunction of the diffraction problem with forced impedance, *Radio Eng and Electron Phys*, 16 (9), 1459-64.
- Nussenzveig, H.M. (1972), *Causality and dispersion relations*, Acad Press, N.Y.
- Ogawa, E., and H. Fujioka (1972), Reflection and transmission of plane waves at a boundary between two conducting media, *Electron and Commun in Japan*, 55 (11), 63-69.
- Okamoto, N., and R. Yamada (1973), General properties of electromagnetic scattering by inhomogeneous anisotropic composite obstacles of arbitrary shape, *J. Appl Phys*, 44 (5), 2161-65.
- O'Kelly, P.D., and M.M.Z. Kharadly (1972), Backscattering of electromagnetic waves from a rough surface, *Canad J. Phys*, 50 (23), 2928-38 .
- Olaofe, G.O. (1974), Scattering cross-section for two spheres, *Q J Mech Appl Math* XXVII (4), 403-422.
- Ollendorff, F. (1972), Reflection of an electromagnetic wave by a moving mirror *Arch Elektrotech* 54 (5), 262-268.
- Ormsby, J.F.A. (1974), Surface currents scattering and applications in the Rayleigh Region, *IEEE Trans. AP-22* , 726-730.
- Ostrovskii, L.A. (1972), Some general relations for waves at the moving boundary between two media, *Sov Phys JETP*, 293-298.
- Otteni, G.A. (1973), Plane wave reflection from a rectangular-mesh ground screen, *IEEE Trans, AP-21* (6), 843-51.

- Parasyuk, Ye.N.; V.P. Vlasov., V.S. Melekestev., Z.O. Mel'nik and A.I. Kardash (1972), On a method of solving the inverse problem of potential theory, *Izv Acad Sci USSR, Phys Solid Earth*, 11, 759-62.
- Pattanayak, D.N., and E. Wolf (1972), General form and a new interpretation of the Ewald-Oseen extinction theorem, *Opt Commun*, 6 (3), 217-220.
- Pavlov, A.L. (1973a), Diffraction at 2 bodies in a locally-inhomogeneous medium, *Vychisl Metody and Program*, 20, 126-133.
- Pavlov, A.L. (1973b), Diffraction of a plane wave at two ideally conducting cylinders in an inhomogeneous medium, *Radio Eng and Electron Phys*, 18 (6), 820-824.
- Peng, S.T. (1973), Rigorous analogies between elastic and E.M. systems, *Appl Phys*, 1, 73-93.
- Permitin, G.V. (1973), Backscattering of scalar wave field by a perfectly reflecting object situated near caustic surface, *Radiophys and Quantum Electron*, 16 (1), 62-68.
- Perng, D.Y.P. (1972), Wave reflection by a periodic medium, *SIAM J Appl Math*, 22 (2), 280-299.
- Perry, W.L. (1974), On the Bojarski Lewis inverse scattering method, *IEEE Trans. AP*, 21, 826-829.
- Peterson, B. and S. Ström (1973), T matrix for electromagnetic scattering from an arbitrary number of scatterers and representations of $E(3)^X$, *Phys Rev D*, 8 (10), 3661-3678.
- Peterson, B. and S. Ström (1974a), Matrix formulation of acoustic scattering from an arbitrary number of scatterers, *J Acoust Soc Amer*, 56, 771-780.
- Peterson B. and S. Ström (1974b), T-matrix formulation of electromagnetic scattering from multi layered scatterers, *Phys Rev. D*, 10 (8), 2670-2684.
- Petit, R., and D. Maystre (1972), Application of the laws of electromagnetism to the study of gratings, *Rev Phys Appl*, 7 (4), 427-441.
- Petrov, B.M. (1972a), Spectral characteristics of the fringing field of a uniformly advancing and rotating impedance cylinder, *Radio Eng and Electron Phys*, 17 (9), 1431-1437.
- Petrov, B.M. (1972b), E.M. wave scattering on a rotating metal cylinder, *Radio Electron and Commun Syst*, 15 (1), 13-21.
- Petrov, B.M. (1973), Diffraction of E.M. waves on reflectors with time periodic parameters, *Radio Electron and Commun Syst*, 16 (2), 52-59.
- Pimenov, Yu V., and A.A. Press (1973), Diffraction of a two-dimensional electromagnetic field on an ideally conducting plane with an infinite straight slit, *Sov Phys-Tech Phys*, 17 (8), 1287-1291.

- Pogorzelski, R.J. (1973), Electromagnetic scattering from a radially moving spherical discontinuity, J. Appl Phys, 44(1), 168-173.
- Radin, A.M., and V.P. Shestopalov (1974), Diffraction of waves by a sphere with apertures, Sov Phys-'Dokl, 18 (10), 642-643.
- Ramm, A.G. (1972), Exterior problems of diffraction, Radio Eng and Electron Phys, 17 (7), 1064-1067.
- Ramm, A.G. (1973), Eigenfunction expansion of a discrete spectrum in diffraction problems, Radio Eng and Electron Phys, 18 (3), 364-369.
- Ramm, A.G. (1974a), Calculation of the characteristic of electromagnetic wave scattering by small bodies having an arbitrary shape, Radio Phys and Quant Electron, 14 (9), 1148-1150.
- Ramm, A.G. (1974b), Scalar scattering on small-bodies of arbitrary shape, Radio Phys and Quantum Electron, 17 (7), 1062-1068.
- Ranger, K.B. (1973), The solution of mixed boundary value problems involving a straight line segment, Utilitas Mathematica, 4, 291-331.
- Ranger, K.B. (1974), A scattering problem for a straight line segment, J. Math Phys, 15, 988-991.
- Reilly, E.D. Jr., (1973), Resonant scattering from inhomogeneous nonspherical targets, J. Comput Phys, 11 (4), 463-492.
- Roach, G.F., and Adams, R.A., (1972), An intrinsic approach to radiation conditions, J. Math Anal Appl, 39, 433-444.
- Rogers, P.H. (1973a), Two dimensional math model for an acoustically soft parabolic cylinder reflector, J. Acoust Soc Amer, 53, 890-898.
- Rogers, P. H. (1973b), Formal solution of the surface Helmholtz integral equation at a nondegenerate characteristic frequency, J. Acoust Soc Amer, 54, 1662-1666.
- Rouniguires, J.L., D. Maystre, R. Petit., M. Cadilhac., (1973), Study of the diffraction by a slit cut in an infinitely conducting screen of arbitrary thickness, *Optics Commun*, 9 (4), 368-373
- Royer, E.G., and R. Mittra (1972), Diffraction of E.M. waves by dielectric steps in waveguides, IEEE Trans MTT, 20, 273-279.
- Satterwhite, R. (1974), Diffraction by a quarter-plane, the exact solution and some numerical results, IEEE Trans. AP,22, 500-503.

- Semenov, B.I. (1972), Scattering of a spherical wave by spherical inhomogeneity with arbitrary refractive index distribution along the radius, *Radio Eng and Electron Phys.*, 17 (8), 1361-1364.
- Senior, T.B.A. (1973), Low frequency scattering, *J. Acoust Soc Amer*, 53, 742-747.
- Shafai, L. (1972a), Scattering by spherically symmetric objects, *Canad J. Phys*, 50 (8), 749-753.
- Shafai, L. (1972b), On the comparison of phase and multi-layer techniques for scattering from cylindrically symmetrical objects, *Int J. Electronics*, 33 (3), 311-319.
- Shafai, L. (1973a), Numerical solution of diffraction problems using the geometry of a strip, *Int J. Electron*, 35 (1), 113-119.
- Shafai, L. (1973b), Convergence of the solution for the far scattered field of a conducting cylinder of arbitrary cross-section, *Int J. Numer Methods Eng.*, 5, 557-564.
- Shafai, L., and P. Bhartia (1973a), Scattering by a conducting aerofoil, *AEU*, 27, 447.
- Shafai, L., and P. Bhartia (1973b), Scattering properties of certain conducting cylindrical geometries, *Can J. Phys*, 51 (8), 861-864.
- Shah, G.A., and M.S. Vardya (1972), Scattering by rough cylindrical particles, *Nature*, 235 (58), 115-116.
- Shamma, S.E., and S.N. Karp (1972), Asymptotic eigenfunctions of a scattering problem, *SIAM J Appl Math*, 22 (1), 14-21.
- Shcherbitskiy, A.N. (1972), Integral equations of a two-dimensional problem on the excitation of an impedance cylinder of arbitrary form near an impedance surface, *Tr. Mosk. IN-TA Radiotekhn Elektroni Avtomatiki*, 55, 121-136.
- Shen, N., and D. Thoe (1972), Resonant states and poles of the scattering matrix for perturbations of $-\Delta$, *J. Math Anal Appl*, 37, 467-491.
- Shestopalov, V.P., and V.V. Shcherbak (1972), Matrix operators in diffraction problems, *Radio Phys and Quant Elect*, 11 (2), 161-166.
- Shiozawa, T., (1973), Phenomenological and electron theoretical study of the electrodynamics of rotating systems, *Proc IEEE*, 61, 1694-1702.
- Shiozawa, T., and S. Seikai (1972a), Electromagnetic wave scattering by an inhomogeneous magnetoplasma column moving in the axial direction, *Electronics and Comm in Japan*, 55-B (4), 80-86.
- Shiozawa, T., and S. Seikai (1972b), Scattering of electromagnetic waves from an inhomogeneous magnetoplasma column moving in the axial direction, *IEEE Trans, AP*, 20 (4), 455-463.

- Sleeman, B.D. (1973), The three-dimensional inverse scattering problem for the Helmholtz Equation, Proc Comb Phil Soc, 73, 477-488.
- Soejima, T., and S. Shimada (1973), Diffraction by double circular irises and scattering by two elliptical reflectors, IEEE Trans. AP, 21, 110-113.
- Solimeno, S. (1974a), Electromagnetic boundary value problems in the presence of moving simple media Part I: Generalities Alta Frequenza, XLIII (12), 1005-1009.
- Solimeno, S. (1974b), Electromagnetic boundary value problems in the presence of moving simple media Part II: Superluminal case, Alta Frequenza, XLIII (12), 1010-1017.
- Solymor, L., J. Appel-Hansen (1974), Maximum backscattering cross section of passive linear arrays, IEEE Trans, AP, 22, 360-361.
- Ström, Staffan (1974), T-matrix for electromagnetic scattering from an arbitrary number of scatterers with continuously varying electromagnetic properties, Phys Rev D, 10 (8), 2685-2690.
- Stahl, A., and H. Wolters (1972), EM boundary conditions and surface effects from a phenomenological point of view, Z. Phys, 255 (3), 227-239.
- Stavroudis, O.N. (1972), Optics of rays, wavefronts and caustics, Acad Press, N.Y.
- Stepnyuk, V.A., R.F. Fikhmanas and P.S.H. Fridberg (1973), Polarizability of a circular aperture close to a parallel screen, Sov Phys-Tech Phys, 43 (4), 845-847.
- Sveshnikov, A.G., A.S. Il'insky and A.L. Pavlov (1972), Diffraction of a plane wave at an ideally conducting cylinder in an inhomogeneous medium, Radio Eng and Electron Phys, 17 (7), 1084-1088.
- Tabbara, W. (1973), On an inverse scattering method, IEEE Trans, AP, 21, 245-246.
- Tai, George R.C., and Richard Paul Shaw (1974), Helmholtz-equation eigenvalues and eigenmodes for arbitrary domains, J. Acoust Soc Am, 56, 796-804.
- Tan, H.S., and David K. Cheng (1973), Solutions to a class of half plane diffraction problems, Radio Sci, 5, 1191-1196.
- Tanaka, K., and K. Hazama (1972), Reflection and transmission of E.M. waves by a moving inhomogeneous medium, Radio Sci, 7 (10), 973-978.
- Tanaka, K., M. Shibukawa and D. Fukumitsu (1972), Diffraction of a wave beam by an aperture, IEEE Trans MTT, 11, 749-755.
- Teague, B.R., and N.R. Zitron (1972), Diffraction by an aperture between two wedges, Appl Sci Res, 26, 127-137.

- Tesche, F.M. (1973a), On the analysis of scattering and antenna problems using the singularity expansion method, IEEE Trans AP, 21, 53-62.
- Tesche, F.M. (1973b), Calculation of the exterior natural frequencies of a wire by the use of Hallen's integral equation, Electron Lett, 9 (24), 558-559.
- Tikhonov, A.N., A.G. Sveshnikov, V.I. Dmitriev and A.S. Il'inskii (1973), Some general algorithms for solving direct and inverse electrodynamics problems, Vychisl Metody and Program, 20, 3-11.
- Tolstoy, I. (1973), Wave propagation, McGraw Hill, N.Y.
- Tong, T.C. (1974), Scattering by a slightly rough cylinder and a cylinder with an impedance boundary condition, Inst. J. Electron, 86, 767-772.
- Towaij, S.J., M.A.K. Hamid and A. Mohsen (1972), Diffraction by an infinite corner reflector transversely loaded by concentric dielectric slabs, Int J Electron, 33 (3), 241-253.
- Towaij, S.J., M.A.K. Hamid (1974), Diffraction by a conducting wedge loaded with radial dielectric slabs, Int J Electron, 37 (3), 333-358.
- Twersky, V. (1973), Multiple scattering of sound by a periodic line of obstacles, J. Acoust Soc Amer, 53, 96-112.
- Ufimtsev, P.Ya. (1974), Open resonator diffraction field, Radiotekh Elektron, 19 (15), 980-994.
- Ukrainets, N.I., and N.A. Khizhnyak (1973), E.M. wave resonant scattering on an ellipsoidal discontinuity in a rectangular waveguide, Radio Tekhnika Kharkov, 25, 105-113.
- Ursell, F. (1973), On the exterior problems of acoustics, Proc Cambridge Philos Soc, 74, 117-125.
- URSI (1974) 1974 URSI Symposium on electromagnetic wave theory, London, England, IEEE Conf Publ 114.
- Uslenghi, P.L.E. (1973), Scattering by a plasma-coated cylinder, Alta Freq., 42 (6), 296-297.
- Vainberg, B.R. (1972), On eigenfunctions of an operator corresponding to the poles of an analytic continuation of the resolvent through the continuous spectrum, Math Sbornik USSR, 16, 307-322.
- Van Bladel, J. (1972), Small apertures in cavities at low frequencies, AEU, 26, 481-486.

- Van Bladel, J. (1973), Circuit parameters from Maxwell's Equations - Appl Sci Res, 28, 381-397.
- Van Buren, A.L., and B.J. King (1972), Acoustic radiation from two spheroids, J. Acoust Soc Amer, 52, 364-372.
- Van den Berg, M., and H.J. VanSchaik (1973), Diffraction of a plane electromagnetic wave by a perfectly conducting elliptic cylinder, Appl Sci Res, 28, 145-157.
- Van den Berg, M., and O.J. Voorman (1973), Diffraction by a grating of cylinders with an arbitrary cross section, Appl Sci Res, 26, 175-182.
- Vandenberghe, F.H., and W.M. Boerner (1972a), On the inverse problem of scattering from a perfectly conducting prolate spheroid, Canad J Phys, 50 (8), 754-759.
- Vandenberghe, F.H., and W.M. Boerner (1972b), On the inverse problem of scattering from a perfectly conducting elliptic cylinder, Canad J Phys, 50 (17), 1987-1992.
- Vandenberghe, F.H., and W.M. Boerner (1972c), A system synthesis approach to the inverse problem of scattering by smooth convex shaped scatterers for the high frequency case, Radio Science, 5, 1163-1169.
- Van Doeren, R.E., (1972), Analysis of dielectric ring scattering, IEEE Trans. AP, 20, 522-524.
- Vasil'ev, E.N., and V.V. Solodukhov (1973), Diffraction of an obliquely incident electromagnetic wave at a dielectric cylinder of arbitrary cross section, Vyshisl Metody and Program, 20, 144-155.
- Voytovich, N.N., B.A. Katsenelenbaum and A.N. Sivov (1972), Stationary functionals for generalized method of eigenfunctions of diffraction theory, Radio Eng and Electron Phys, 17 (2), 206-212.
- Wait, J.R. (1972a), Electromagnetic scattering from a wire grid parallel to a planar stratified medium, IEEE Trans. AP, 20, 672-675.
- Wait, J.R. (1972b), Theory of E.M. reflection from a parallel grid of dielectric coated wires buried in the earth, Canad J Phys, 50 (18), 2149-2157.
- Waterman, P.C. (1971), Symmetry, unitarity and geometry in electromagnetic scattering, Phys Rev D, 3 (4), 825-839.
- Watson, P.A., and S.I. Ghobrial (1972), Cross polarizing effects of a water film on a parabolic reflector at microwave frequencies, IEEE Trans. AP, 20, 668-671.
- Wegrowicz, L.A. (1972), On the secondary sources of the electromagnetic field over the ground air interface, Arch Elektrotech (Poland) ,21 (2), 315-329.

- Welton, P.J. (1973), Potential-method formulation of acoustic-wave scattering by rough surfaces, *J. Acoust Soc Amer*, 54, 66-73.
- Weston, V.H. (1972), On the inverse problem for a hyperbolic dispersive partial differential equation, *J. Math Phys*, 13, 1952-1956.
- Weston, V.H. (1974), On inverse scattering, *J. Math Phys*, 15, 209-213.
- Weston, V.H., and R.J. Krueger, (1973), On the inverse problem for a hyperbolic dispersive partial differential equation II, *J. Math Phys*, 14, 406-408.
- White, F.E., and M. Sonn (1972), References to contemporary papers on acoustics, *J. Acoustic Soc Amer*, 52, 1322-1367.
- Wilson, L.O. (1974), The shielding of a plane wave by a cylindrical array of infinitely long thin wires, *IEEE Trans. AP*, 22, 689-696.
- Wirgin, A. (1973a), Green function theory of the scattering of electromagnetic waves from a cylindrical boundary of arbitrary shape, *Opt Commun*, 7 (1), 65-69.
- Wirgin, A (1973b), Resonance scattering of electromagnetic waves from a rectangular groove on a metallic mirror, *Opt Commun*, 7 (1), 70-75.
- Wolf, E. (1973), Generalized extinction theorem and its role in scattering theory, *Coherence and Quantum Optics*, 5, 339-357.
- Wolfe, Peter (1972), Diffraction of plane waves by a strip; exact and asymptotic solutions, *SIAM J. Appl Math*, 23 (1), 118-132.
- Wolfe, Peter (1973), Addendum to diffraction of plane waves by a strip; exact and asymptotic solutions the solution in the general case, *SIAM J. Appl Math*, 24 (4), 613-618.
- Yasumoto, K. (1972), Reflection and Transmission of electromagnetic plane waves at a boundary moving in the normal direction *Elect and Comm in Japan*, 55-B (1), 41-47.
- Yeh, C., P.K.C. Wang (1972), Scattering of obliquely incident waves by inhomogenous fibers, *J. Appl Phys*, 43 (10), 3999-4006.
- Zaboronkova, T.M., and I.G. Kondratev(1972), The application of Lorentz lemma to calculation of excitation coefficients of diffraction modes, *Radio Phys and Quantum Electron*, 15 (2), 1894-1904.
- Zakhar'yev, L.N., and A.A. Lemanskiy (1972), Wave scattering by "Black" bodies (in Russian) *IZD-VO Sovetskoye Radio*
- Zhurov, S.M., and V.S. Losev (1973), Diffraction of electromagnetic waves at a junction of circular waveguides I general solution, *Antenny*, 18, 114-124.
- Zipfel, G.G., Jr. (1974), Scattering of scalar waves from a random irregular interface, *J. Math Phys*, 15 (1), 101-113.