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- Schemm, C. E., and Smith G. D., "Modeling of the Chesapeake Bay," 22nd American Chemical Society Regional Meeting, Millersville, Pa. (24 May 1988).
- Sibeck, D. G., "Multipoint Observations of the Magnetospheric Response to Short-Period Solar Wind Dynamic Pressure Variations," Imperial College, London (Aug 1988).
- Sigillito, V. G., "Artificial Intelligence Applications for Sensors," Alcoa Laboratories Centennial Technical Seminar, Nemacon, Pa. (13-17 Jun 1988).
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- Spall, J. C., "A Historical Perspective on the Kalman Filter and Some Recent Results in Non-Gaussian Modeling," Washington Statistical Society Meeting, Washington (16 Nov 1988).
- Takahashi, K., "Spacecraft Observations of Compressional Hydromagnetic Waves in the Magnetosphere," Princeton University Plasma Physics Laboratory Colloquium (4 May 1988).

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- Baker, K. B., and Greenwald, R. A. (APL), and Villain, J. P. (LPCE/CNRS, France), "Altitude Measurements of EIC Waves in the E-Region Using the Goose Bay Radar";
- Cheng, A. F., "Energetic Particle Acceleration Mechanisms in Planetary Magnetospheres";
- Christon, S. P., "Magnetospheric Boundary Layer Inclusions at Mercury: A Simple Explanation of the ~6-s C Event Variations";
- Decker, R. B., "Particle Acceleration at Shocks with Surface Fluctuations";
- Erlanson, R. E., Zanetti, L. J., and Potemra, T. A. (APL), Murphree, J. S., and Vo, H. (Univ. Calgary), Eliasson, L., and Andre, M. (Swedish Inst. Space Phys.), and Marklund, G. (Royal Inst. Tech., Sweden), "VIKING Case Study of a Polar Arc";
- Ishimoto, M., and Meng, C.-I. (APL), and Romick, G. J. (Univ. Alaska), "Simple O₂ Schumann-Runge Absorption Simulation for Auroral LBH Band Emissions";
- Kane, M., Mauk, B. H., and Krimigis, S. M., "The Plasma Sheet Boundary Layer of the Uranian Magnetosphere";
- Lopez, R. E. (Applied Res. Corp.), and Lui, A. T. Y., Sibeck, D. G., Takahashi, K., McEntire, R. W., Potemra, T. A., and Krimigis, S. M. (APL), "Some Statistical

- Results from a Study of Substorms Observed by AMPTE/CCE";
- Lui, A. T. Y., "What is Magnetospheric Substorm Expansion Made of?";
- McEntire, R. W., Lui, A. T. Y., and Krimigis, S. M., "Phase Space Density Temporal Variations of Energetic Ring Current Ion Species During Geomagnetic Storms";
- Meng, C.-I. (APL), Huffman, R. E. (AFGL), and Makita, K. (Takushoku Univ., Tokyo), "Quiet Time Polar Auroral Distributions";
- Mitchell, D. G., Christon, S. P., and Williams, D. J. (APL), Frank, L. A., and Huang, C. Y. (Univ. Iowa), and Eastman, T. E. (NASA), "Ion Distributions in the Central Plasma Sheet During Periods with Low Levels of Geomagnetic Activity";
- Murphree, J. S., Venkatesan, D., and Vo, H. (Univ. Calgary), Potemra, T. A., Zanetti, L. J., and Erlandson, R. E. (APL), and Lundin, R. (Swedish Inst. Space Phys.), "Correlation of UV Auroral Forms, Hot Plasma, and Birkeland Currents in the 1200-1400 MLT Sector";
- Newell, P. T., and Meng, C.-I., "The Polar Cusp and the Cleft/LLBL: Low Altitude Identification and Statistical Local Time Variation";
- Potemra, T. A., Zanetti, L. J., Takahashi, K., and Erlandson, R. E. (APL), Marklund, G. T., and Block, L. P. (Swedish Inst. Space Phys.), Lühr, H. (Univ. Braunschweig), and Lazarus, A. (MIT), "Multi-Satellite and Surface Observations of a Transient ULF Pulsation";
- Roelof, E. C., "Global Topology of Electrical Currents Deduced from ENA Images of Storm-Time Ring Currents Ions";
- Sarris, E. T., and Anagnostopoulos, G. C. (Demokritos Univ. Thrace), and Krimigis, S. M. (APL), "Preferential Escape of Magnetospheric Ions through the Dusk Bow Shock: Simultaneous Observations Upstream from the Dawn and Dusk Scales";
- Sibeck, D. G. (APL), Ross, K. S. (American Friends School, Philadelphia), and McEntire, R. W. (APL), "Charge States of Substorm-Injected Ions";
- Sibeck, D. G. (APL), and Hughes, W. J. (Boston Univ.), "On the Origin and Evolution of Magnetotail Flux Ropes and Plasmoids";
- Takahashi, K., Potemra, T. A., McEntire, R. W., and Zanetti, L. J., "Magnetospheric ULF Waves Observed During the Major Magnetospheric Compression of November 1, 1984";
- Yumoto, K., and Saito, T. (Tohoku Univ. Japan), Takahashi, K., Potemra, T. A., and Zanetti, L. J. (APL), and Menk, F. W., and Fraser, B. J. (Univ. Newcastle, Australia), "Relation of Pi 1-2 Magnetic Pulsations at L = 1.3-2.1 to Substorm-Associated Phenomena at AMPTE/CCE";
- Zanetti, L. J., Mauk, B. H., Lui, A. T. Y., Potemra, T. A., and Roelof, E. C. (APL), and Iijima, T. (Univ. Tokyo, Japan), "The Equatorial Ring Current as Determined from AMPTE/CCE and ISEE-1: Implications on Modelling Efforts."
- The following papers were presented at the 10th Annual Meeting of the Bioelectromagnetics Society, Stamford, Conn. (19-24 Jun 1988):
- Kues, H. A., and Adrian, F. J. (APL), Phelan, A. M., and Luty, G. A. (JHMI), and Monahan, J. C. (FDA), "Preliminary ESR Analysis of Rabbit Ocular Tissue Following Pulsed 2.45-GHz Microwave Exposure";
- Kues, H. A., and McLeod, D. S. (APL), D'Anna, S. A., and Luty, G. A. (JHMI), and Monahan, J. C. (FDA), "Histological Evaluation of Microwave-Induced Vascular Leakage in the Iris";
- Monahan, J. C. (FDA), Kues, H. A., and McLeod, D. S. (APL), and D'Anna, S. A., and Luty, G. A. (JHMI), "Lowering of Microwave Exposure Threshold for Induction of Primate Ocular Effects by Timolol Maleate."
- The following papers were presented at the International Conference on Auroral Physics, Cambridge, England (10-15 Jul 1988):
- Erlandson, R. E., Zanetti, L. J., and Potemra, T. A. (APL), Murphree, J. S. (Univ. Calgary), Block, L., and Marklund, G. (Royal Inst. Technol., Stockholm), Holmgren, G. (Swedish Inst. Space Phys.), Pottellette (CRPE, France), and Lundin, R. (Swedish Inst. Space Phys.), "Aurora Near the Polar Cusp: Magnetic Fields, Electric Fields, and Charged Particles";
- Ishimoto, M., and Meng, C.-I. (APL), and Romick, G. J. (KIA Consultants, Inc., Fairbanks), "Simple O₂ Schumann-Runge Absorption Simulation for Auroral LBH Band Emissions";
- Lui, A. T. Y. (APL), and Venkatesan, D., Vo, H. B., and Murphree, J. S. (Univ. Calgary), "Observations of the Dayside Aurora by Viking Ultraviolet Imager";
- Mauk, B. H., and Meng, C.-I., "The Aurora and Middle Magnetospheric Processes, a Review."
- The following papers were presented at the XXVII COSPAR, Espoo, Finland (18-29 Jul 1988):
- Bythrow, P. F., Meng, C.-I., Potemra, T. A., Zanetti, L. J., and Erlandson, R. E. (APL), and Huffman, R. E. (AFGL), "Birkeland Currents, Charged Particles and Dayside Auroral Emissions: A Multi-Satellite View";
- Gold, R. E., Decker, R. B., and Krimigis, S. M. (APL), and Lanzerotti, L. J., and MacLennan, C. G. (AT&T Bell Labs.), "Large Scale Radial and Latitudinal Characteristics of Interplanetary Shocks and Shock Accelerated Ions";
- Gold, R. E., Decker, R. B., and Krimigis, S. M. (APL), and Lanzerotti, L. J., MacLennan, C. G., and Thomson, D. J. (AT&T Bell Labs.), "The Large Scale Velocity of Shocks in the Heliosphere as Revealed by Radial and Latitudinal Correlations of Shock Accelerated Ions";
- Greenwald, R. A., and Baker, K. B., "First Results of Conjugate Observations in the High Latitude Ionosphere with Coherent HF Radars";
- Huang, C. Y. (Univ. Iowa), Mitchell, D. G. (APL), and Frank, L. A. (Univ. Iowa), "Rapid Plasma Sheet Heating During Substorm Activity";
- Iijima, T. (Univ. Tokyo), and Potemra, T. A., and Zanetti, L. J. (APL), "Large-Scale Characteristics of the Ring Current Determined by AMPTE/CCE";
- Lanzerotti, L. J. (AT&T Bell Labs.), Gold, R. E. (APL), Thomson, D. J. (AT&T Bell Labs.), Decker, R. B., and Krimigis, S. M. (APL), and MacLennan, C. G. (AT&T Bell Labs.), "Statistical Properties of Shock Accelerated Ions in the Heliosphere Between 1 and 30 AU";
- Lopez, R. E. (Applied Res. Corp.), and Lui, A. T. Y., McEntire, R. W., Potemra, T. A., and Krimigis, S. M. (APL), "A Statistical Study of Magnetic Field Changes During Substorms in the Near-Earth Tail";
- Lopez, R. E. (Applied Res. Corp.), Baker, D. N. (NASA), Lui, A. T. Y., and Sibeck, D. G. (APL), Belian, R. D. (Los Alamos National Lab.), and McEntire, R. W., Potemra, T. A., and Krimigis, S. M. (APL), "The Radial and Longitudinal Propagation Characteristics of Substorm Injections";
- Lui, A. T. Y., McEntire, R. W., and Krimigis, S. M. (APL), and Hamilton, D. C., and Gloeckler, G. (Univ. Maryland), "Electric Current Density from Different Ionic Species in the Storm Time Ring Current";
- McEntire, R. W., Lui, A. T. Y., and Krimigis, S. M., "Temporal Variation of the Energetic Ring Current Ion Populations";
- Mitchell, D. G., and Williams, D. J. (APL), Huang, C. Y., and Frank, L. A. (Univ Iowa), and Elphic, R. C., and Fritz, R. A. (Los Alamos National Lab.), "Substorm Energization of the Plasma Sheet in the Near-Earth Magnetotail";
- Potemra, T. A., Zanetti, L. J., Bythrow, P. F., and Erlandson, R. E. (APL), Marklund, G. T., and Block, L. P. (Royal Inst. Technol., Stockholm), and Lühr, H. (Univ. Braunschweig), "Multi-Satellite and Surface Observations of Geomagnetic Field Oscillations (Coincident AMPTE/CCE, VIKING, IMP-8 and EISCAT CROSS Magnetic Field Observations)";
- Roelof, E. C., "Remote Sensing of the Ring Current Using Energetic Neutral Atoms";
- Roelof, E. C., "Solar Energetic Particle Propagation in the Three Dimensional Heliosphere";
- Ruohoniemi, J. M., Greenwald, R. A., and Baker, K. B. (APL), Hanuise, C. (Laboratoire de Sondages Electromagnetiques de l'Environnement Terrestre), and Dudeney, J. R. (British Antarctic Survey), "Mapping Convective Plasma Flow in the High Latitude Ionosphere with Coherent HF Radars";
- Sibeck, D. G., and McEntire, R. W., "Multiple Satellite Observations of Magnetospheric Particle Leakage";
- Sibeck, D. G. (APL), Lopez, R. E. (Applied Res. Corp.), and Roelof, E. C. (APL), "Solar Wind and IMF Control of the Magnetopause Position";
- Takahashi, K., "Multisatellite Studies of ULF Waves";
- Williams, D. J., Mitchell, D. G., and Christon, S. P., "Implications of Large Flow Velocity Signatures in Nearly Isotropic Ion Distributions."
- The following papers were presented at the APS Topical Conference on Plasma Astrophysics, Santa Fe, N.M. (19-23 Sep 1988):
- Anagnostopoulos, G. C., and Sarris, E. T.

(Demokritos Univ. of Thrace, Greece), and Krimigis, S. M. (APL), "Conditions for Acceleration of Solar Energetic Ions at the Earth's Bow Shock to High Energies"; Cheng, A. F., "Spindown of Radio Pulsars: Implications for Pulsar Magnetospheres"; Decker, R. B., "Particle Acceleration at Shocks with Surface Fluctuations"; Dodopoulos, C. A., and Sarris, T. E. (Demokritos Univ. of Thrace, Greece), and Decker, R. B. (APL), "Fitting of Voyager-2 Observations of Shock Acceleration to a SDA Model"; Krimigis, S. M., and Cheng, A. F., "Ion Beam Acceleration in Jupiter's Magnetotail."

The following papers were presented at the NATO Advanced Research Workshop on Electromagnetic Coupling in the Polar Clefts and Caps, Lillehammer, Norway (20-24 Sep 1988):

Bythrow, P. F., "The Electrodynamics of Auroral Features near 1400 MLT: A Multisatellite Perspective"; Newell, P. T., and Meng, C.-I., "On Quantifying the Distinction Between the Low Altitude Map and Cleft/LLBL"; Potemra, T. A., "Large Scale Polar Current Systems"; Potemra, T. A., "The Saga of Fridtjof Nansen."

The following papers were presented at the Mid-Atlantic Regional Probability and Statistics Day, Laurel, Md. (22 Oct 1988):

Chin, D. C., "An Efficient Numerically Stable Method for Linear Model Estimation"; Hill, S. D., and Spall, J. C., "Information-Theoretic Prior Distributions for Bayesian Analysis"; Levy, L. J., "Application of Kalman Filters to Maximum Likelihood Identification of Large Scale Dynamic Models"; Maryak, J. L., and Spall, J. C., "Rate of Convergence to Normality for M-Estimates Based on Non-I.I.D Data"; Rahenkamp, J. J., and Telford, J. K., "Comparison of Five Statistical Tests for Equality of Two Independent Binomial Populations"; Spall, J. C., "A Bayesian Procedure for Isolating Misspecified Parameters in Large-Dimensional Models."

The following papers were presented at the 1988 Fall Meeting, American Geophysical Union, San Francisco (4-10 Dec 1988):

Anderson, B. J., and Bythrow, P. F. (APL), Robinson, R. M. (Lockheed Palo Alto Lab.), and Hardy, D. A., and Rich, F. J. (AFGL),

"Vertical Distributions of Auroral Pedersen Currents and Joule Heating from DMSP-F7: a 2D Model"; Bythrow, P. F., Potemra, T. A., and Meng, C.-I., "Conjugate Observations of Charged Particles and Birkeland Currents near 1400 MLT"; Carbary, J. F., and Meng, C.-I., "Recent Observations of the Dusk Limb as Seen from Low Earth Orbit"; Cheng, A. F. (APL), and Sarris, E. T. (Demokritos Univ. of Thrace, Greece), "Differential Drifts in Non-Uniform Shocks and Forbush Decreases"; Christon, S. P., Mitchell, D. G., and Williams, D. J. (APL), and Frank, L. A., and Huang, C. Y. (Univ. Iowa), "Central Plasma Sheet Particle Distributions During Periods with High Levels of Geomagnetic Activity"; Decker, R. B., Gold, R. E., and Krimigis, S. M. (APL), and Lanzerotti, L. J., and MacLennan, C. G. (AT&T Bell Labs.), "Recovery of Shock Acceleration in 1 to 35 AU at the Onset of Solar Cycle 22"; Erlanson, R. E., Zanetti, L. J., and Potemra, T. A. (APL), and Block, L. P. (Royal Inst. Technol., Stockholm, Sweden), "VIKING Magnetic and Electric Field Observations of Pc 1 Waves at Mid-Latitudes"; Ishimoto, M., and Meng, C.-I. (APL), and Romick, G. J. (Aeronomy Program, NSF), "Satellite Observation of Doppler Shifted Auroral Lyman Alpha"; Lopez, R. E. (Applied Res. Corp.), Baker, D. N. (NASA/GSFC), Belian, R. E. (LANL, Los Alamos), and McEntire, R. W., and Zanetti, L. J. (APL), "Propagation of Substorm Onset"; Lui, A. T. Y., and Krimigis, S. M., "Behavior of Energetic Ions of Different Ionic Species During Substorm Injections"; McEntire, R. W. (APL), Lopez, R. E. (Applied Res. Corp.), and Sibeck, D. G., and Krimigis, S. M. (APL), "The Energetic Ion Injection Boundary"; Meng, C.-I., and Carbary, J. F., "Recent Observations of Aeronomical Interest Made from a Spacecraft in Low Earth Orbit"; Krimigis, S. M. (APL), and Sarris, E. T., Anagnostopoulos, G. C., and Pavlos, G. P. (Demokritos Univ. of Thrace, Greece), "Determination of Escape Patterns of Magnetospheric Ions by Multispacecraft Observations Inside the Plasma Sheet, Magnetosheath and Solar Wind"; Pavlos, G. P., Sarris, E. T., and Sarofopoulou, D. V. (Demokritos Univ. of Thrace, Greece), and Krimigis, S. M. (APL), "Multispacecraft Monitoring of Energetic Ion Intensities and Intensity-Gradients Inside the Plasma Sheet"; Porter, D. L. (APL), and Horton, C. (Naval Oceanographic Office), "Determination of Mesoscale Features in the Gulf Stream Us-

ing Geosat Altimetric Measurements"; Sibeck, D. G. (APL), Lepping, R. P. (LEP, GSFC), Lopez, R. E. (Applied Res. Corp.), and Potemra, T. A. (APL), "Case Studies of Upstream Conditions During Long-Period (3-20 min) Geomagnetic Pulsations"; Takahashi, K. (APL), Kokubun, S. (Univ. Tokyo), Sakurai, T. (Tokai Univ., Japan), McEntire, R. W., and Potemra, T. A. (APL), and Lopez, R. E. (Applied Res. Corp.), "AMPTE/CCE Observations of Substorm-Associated Standing Alfvén Waves in the Midnight Sector"; Trochoutsos, P., and Sarris, E. T. (Demokritos Univ. of Thrace, Greece), and Krimigis, S. M. (APL), "Anisotropies of Ambient Energetic Ions in Corotating Streams: Multispacecraft Observations"; Sarofopoulou, D. V., and Sarris, E. T. (Demokritos Univ. of Thrace, Greece), and Krimigis, S. M. (APL), "Fine-Structure of Particle Bursts Inside the Plasma Sheet"; Sarris, E. T., Pavlos, G. P., and Sarofopoulou, D. V. (Demokritos Univ. of Thrace, Greece), and Krimigis, S. M. (APL), "Energetic Particles During the Cooling Process of High Plasma in the Magnetotail."

COLLOQUIA

18 Nov 1988—"Chaos and Fractals in Non-linear Dynamics," C. Grebogi, University of Maryland.
 2 Dec—"New Opportunities with Microdynamic Systems," R. S. Muller, University of California, Berkeley.
 9 Dec—"New Developments in Explosives Technology," P.-A. Persson, New Mexico Institute of Mining and Technology.
 16 Dec—"Superconducting Technology: A Look at Japan," K. Moorjani, APL.
 6 Jan 1989—"How Well is the Puli Exclusion Principal Obeyed?" O. W. Greenberg, University of Maryland.
 13 Jan—"Computer Viruses," P. D. Garnett, SYSCON Corp.
 20 Jan—"Recent Topics on Energy Storage Using Superconductivity," M. Masuda, Research Association of Superconducting Magnetic Storage (Japan).
 27 Jan—"The Anomalous Muon Content of Air Showers from Hercules X-1," J. A. Goodman, University of Maryland.
 3 Feb—"Computer-Assisted Proofs in Mathematical Physics," R. De La Llave, Princeton University.
 10 Feb—"Privatization: Public Versus Private Costs," S. H. Hanke, JHU.
 17 Feb—"The Chemist's View of High Temperature Superconductivity," A. W. Sleight, Dupont/University of California, Santa Barbara.

U.S. PATENTS (1988)

Q. E. Dolecek, *Memory-Linked Wavefront Array Processor*, No. 4,720,780, 19 Jan:

A versatile and high-speed array processor comprised of a linear array of processor elements interconnected by dual-port memory linking means. Local/data-driven control is obtained by using asynchronous handshaking between the processing elements and the memory linking means. Each processor element is capable of simultaneous arithmetic computation, communication in two directions, logic decisions, and program control modification.

W. D. Stanbro and A. L. Newman, *Capacitive Chemical Sensor for Detecting Certain Analytes, Including Hydrocarbons in a Liquid Medium*, No. 4,728,882, 1 Mar:

A sensor device useful for detecting small traces of hydrocarbons and other selected analytes in a liquid medium, based on the formation of nucleated bubbles at the surface of a planar capacitor.

R. E. Fischell, *Programmable Control Means for Providing Safe and Controlled Medication Infusion*, No. 4,731,051, 15 Mar:

A remotely programmable controller for an implanted medication infusion pump, including a running integral dosage limiter and other safety features that prevent an inadvertent or intentional medication overdose, as well as means to monitor the implant and to provide an alarm if any improper or potentially unsafe operation is detected.

R. E. Fischell, *Manually Actuated Hydraulic Sphincter*, No. 4,731,083, 15 Mar:

An implantable, manually actuated hydraulic urinary sphincter system for maintaining continence, designed to compensate automatically for changes in bladder/abdominal pressure and capable of being adjusted after implant without surgery.

R. S. Potember, T. O. Poehler, and R. C. Benson, *Optical Storage and Switching Devices Using Organic Charge Transfer Salts*, No. 4,731,756, 15 Mar:

An optically sensitive medium comprising a film of organic charge transfer salt, proposed for use as an erasable optical memory device and bistable optoelectronic switch.

H. D. Black, J. Daniels, N. Levanon, and T. E. Strikwerda, *Platform Transmitter Terminal (PTT) for Use with an Argos Type Satellite System and Utilizing a Solar Array/Rechargeable Battery Power Source*, No. 4,731,870, 15 Mar:

A small, lightweight transmitter unit with a solar-rechargeable battery, designed for use in an Argos-type satellite system to permit tracking of migratory birds and animals.

E. J. Hoffman, *Short-Circuit-Proof Connector Clip for a Multiterminal Circuit*, No. 4,749,362, 7 Jun:

A connector clip particularly useful in testing a dual in-line packaged integrated circuit.

R. E. Thurber, R. J. Prengaman, J. Phipps, and R. Rzemien, *Coherent Radar Digital Data Collector and Sampling Technique for*

Noncoherent Transmitter Radars, No. 4,768,035, 30 Aug:

A processor for extracting Doppler data from a noncoherent radar system.

J. J. Wozniak and K. Leong, *Single-Use, Self-Annuling Injection Syringe*, No. 4,781,683, 1 Nov:

A self-annulling syringe with a hydrophilic plug that renders the device inoperable after a single use.

R. E. Fischell, *Apparatus for Detecting a Condition of a Medication Infusion System and Providing an Informational Signal in Response Thereto*, No. 4,784,645, 15 Nov:

Apparatus for monitoring an implantable medication infusion system to indicate when the stored medication level is low and when the actual medication pumping action does not correspond with desired pumping action.

R. E. Fischell, *Manually Actuated Hydraulic Sphincter Having a Mechanical Actuator*, No. 4,784,660, 15 Nov:

An improved mechanical actuator for an implanted hydraulic urinary sphincter device.

W. I. Sternberger, *Cache Memory and Pre-Processor*, No. 4,788,656, 29 Nov:

Apparatus for interfacing between a host computer and a peripheral device, capable of functioning as an apparent dedicated memory for either the computer or the peripheral, depending on the operational mode of the system.