

Chronological Index

G89-092 Improved Time-Domain Stability Robustness Measures for Linear Regulators. Djordjija B. Petkovski, *University of Novi Sad, Yugoslavia* (12, 4, p. 595) Engineering Note

Technical Comment by Nasser M. Khraishi, *Systems Control Technology, Inc.*

Reply (14, 1, p. 222)

G90-158 Robust Control Design with Real-Parameter Uncertainty and Unmodeled Dynamics. Hsi-Han Yeh, Siva S. Banda and Sharon A. Heise, *Flight Dynamics Laboratory, Wright-Patterson AFB*; and Andrew C. Bartlett, *University of Massachusetts* (13, 6, p. 1117) Article

Errata (14, 4, p. 864)

G91-001 Beyond Singular Values and Loop Shapes (Tutorial). Gunter Stein, *Honeywell Systems and Research Center*; and John C. Doyle, *California Institute of Technology* (14, 1, p. 5) Article

G91-002 Continuous Global N -Tuple Coverage with $(2N + 2)$ Satellites. John E. Draim, *Space Applications Corporation* (14, 1, p. 17) Article based on AIAA Paper 89-381

G91-003 Reduced-Dynamic Technique for Precise Orbit Determination of Low Earth Satellites. S. C. Wu, T. P. Yunck and C. L. Thornton, *Jet Propulsion Laboratory, California Institute of Technology* (14, 1, p. 24) Article based on AIAA Paper 87-410

G91-004 Librational Instability of Rigid Space Station Due to Translation of Internal Mass. C. H. Spenny and T. E. Williams, *Air Force Institute of Technology, Wright-Patterson AFB* (14, 1, p. 31) Article based on AIAA Paper 89-3515 CP899

G91-005 Passive Attitude Damping of Alternative Assembly Configurations of Space Station Freedom. James W. Wade, *University of Colorado* (14, 1, p. 36) Article based on AIAA Paper 89-3435 CP899

G91-006 Adaptable Method of Managing Jets and Aerosurfaces for Aerospace Vehicle Control. Joseph A. Paradiso, *Charles Stark Draper Laboratory, Inc.* (14, 1, p. 44) Article based on AIAA Paper 89-3429 CP899

G91-007 Gibbs Phenomenon in Structural Control. H. Baruh and S. S. K. Tadikonda, *Rutgers University* (14, 1, p. 51) Article based on AIAA Paper 89-3485 CP899

G91-008 Partitioned Solution Procedure for Control-Structure Interaction Simulations. K. C. Park, *University of Colorado*; and W. Keith Belvin, *NASA Langley Research Center* (14, 1, p. 59) Article based on AIAA Paper 89-1238 CP891

G91-009 Model Reduction for Flexible Space Structures. Wodek Gawronski, *Jet Propulsion Laboratory, California Institute of Technology*; and Trevor Williams, *University of Cincinnati* (14, 1, p. 68) Article based on AIAA Paper 89-1339 CP891

G91-010 Special Class of Nonlinear Damping Models in Flexible Space Structures. Anren Hu, *Dynacs Engineering Corporation*; Lawrence W. Taylor, *NASA Langley Research Center*; and Ramendra P. Singh, *Dynacs Engineering Corporation* (14, 1, p. 77) Article

G91-011 Nonlinear Behavior of a Passive Zero-Spring-Rate Suspension System. Stanley E. Woodard and Jerrold M. Housner, *NASA Langley Research Center* (14, 1, p. 84) Article

G91-012 Magellan In-Flight Gyro/Star Scanner Misalignment Calibration. Jack N. Boone, *Martin Marietta Corporation* (14, 1, p. 90) Article

G91-013 Approach to Control Moment Gyroscope Steering Using Feedback Linearization. John Dzielski, *Pennsylvania State University*; Edward Bergmann and Joseph A. Paradiso, *Charles Stark Draper Laboratory*; Derek Rowell and David Wormley, *Massachusetts Institute of Technology* (14, 1, p. 96) Article

G91-014 Integrated Flight/Propulsion Control System Design Based on a Centralized Approach. Sanjay Garg and Duane L. Mattern, *Sverdrup Technology, Inc.*; and Randy E. Bullard, *NASA Langley Research Center* (14, 1, p. 107) Article based on AIAA Paper 89-3520 CP899

G91-015 Analytical Solutions to a Guidance Problem. J. E. Cochran Jr., T. S. No and D. G. Thaxton, *Auburn University* (14, 1, p. 117) Article based on AIAA Paper 88-4222 CP8811

G91-016 Optimal Aeroassisted Intercept Trajectories at Hyperbolic Speeds. Elmer G. Gilbert, Robert M. Howe, Ping Lu and Nguyen X. Vinh, *University of Michigan* (14, 1, p. 123) Article based on AIAA Paper 89-3444 CP899

G91-017 Identification of Time Delays in Flight Measurements. J. Blackwell and R. A. Feik, *Aeronautical Research Laboratory, Australia* (14, 1, p. 132) Article

G91-018 Computation of the Real Structured Singular Value via Polytopic Polynomials. B. C. Chang and O. Ekdal, *Drexel University*; H. H. Yeh and S. S. Banda, *Flight Dynamics Laboratory, Wright-Patterson AFB* (14, 1, p. 140) Article

G91-019 Weak Hamiltonian Finite Element Method for Optimal Control Problems. Dewey H. Hodges and Robert R. Bless, *Georgia Institute of Technology* (14, 1, p. 148) Article

G91-020 High Performance Linear-Quadratic and H-Infinity Designs for a "Supermaneuverable" Aircraft. Petros Voulgaris and Lena Valavani, *Massachusetts Institute of Technology* (14, 1, p. 157) Article

G91-021 Missile Autopilot Robustness to Uncertain Aerodynamics: Stability Hypersphere Radius Calculation. Kevin A. Wise, *McDonnell Douglas Missile Systems Company* (14, 1, p. 166) Article

G91-022 Stability Augmentation and Control Decoupling for the Airborne Remotely Operated Device. John E. White and John R. Phelan, *Sandia National Laboratories* (14, 1, p. 176) Article based on AIAA Paper 87-2453 CP878

G91-023 New Technique for Aircraft Flight Control Reconfiguration. Marcello R. Napolitano and Robert L. Swaim, *Oklahoma State University* (14, 1, p. 184) Article based on AIAA Paper 89-3425 CP899

G91-024 Closed-Loop Assessment of Flight Simulator Fidelity. Ronald A. Hess and Terry Malsbury, *University of California, Davis* (14, 1, p. 191) Article based on AIAA Paper 89-0014

G91-025 Technique for Predicting Longitudinal Pilot-Induced Oscillations. R. A. Hess and R. M. Kalteis, *University of California, Davis* (14, 1, p. 198) Article

G91-026 National Aerospace Plane Longitudinal Long-Period Dynamics. Donald T. Berry, *NASA Ames Research Center* (14, 1, p. 205) Engineering Note based on AIAA Paper 88-4358 CP8810

G91-027 Stability Tests of Spin-Stabilized Spacecraft in the Presence of Thrust. Rudolf X. Meyer, *The Aerospace Corporation* (14, 1, p. 206) Engineering Note

G91-028 Comparison of the Least-Squares Moving-Block Technique with Ibrahim's Method. Ahmed Omar Amrani, *Advanced Rotorcraft Technology, Inc.* (14, 1, p. 208) Engineering Note

G91-029 Contribution of Zonal Harmonics to Gravitational Moment. Carlos M. Roithmayr, *NASA Johnson Space Center* (14, 1, p. 210) Engineering Note

G91-030 Satellite Relocation by Tether Deployment. Geoffrey A. Landis and Frank J. Hrach, *NASA Lewis Research Center* (14, 1, p. 214) Engineering Note

G91-031 Attitude and Spin Rate Control of a Spinning Satellite Using Geomagnetic Field. Luiz Danilo Damasceno Ferreira, *Instituto de Pesquisas Espaciais, S. José Campos, Brazil*; and José Jaime da Cruz, *Instituto de Pesquisas Espaciais, S. José dos Campos, Brazil* (14, 1, p. 216) Engineering Note

G91-032 Approach to Robust Control Systems Design. R. T. Yanushevsky, *University of Maryland, Baltimore Campus* (14, 1, p. 218) Engineering Note

G91-035 Collision Detection for Spacecraft Proximity Operations. Robin M. Vaughan, *Jet Propulsion Laboratory, California Institute of Technology*; Edward V. Bergmann, *Charles Stark Draper Laboratory, Inc.*; and Bruce K. Walker, *University of Cincinnati* (14, 2, p. 225) Article

G91-036 Star Pattern Identification Aboard an Inertially Stabilized Spacecraft. Jean Claude Kosik, *Centre National d'Etudes Spatiales, France* (14, 2, p. 230) Article

G91-037 Attitude Determination Using Antenna Polarization Angles. S. A. Parvez, *GTE Spacenet* (14, 2, p. 236) Article based on AIAA Paper 89-3620 CP899

G91-038 Optimal Projection Control of an Experimental Truss Structure. Lee D. Peterson, *Purdue University* (14, 2, p. 241) Article based on AIAA Paper 89-3434 CP899

G91-039 Sensor Placement for On-Orbit Modal Identification and Correlation of Large Space Structures. Daniel C. Kammer, *University of Wisconsin* (14, 2, p. 251) Article

G91-040 Model Reduction and Control of Flexible Structures Using Krylov Vectors. Tzu-Jeng Su and Roy R. Craig Jr., *University of Texas at Austin* (14, 2, p. 260) Article based on AIAA Paper 89-1237 CP891

G91-041 Accommodation of Kinematic Disturbances During Minimum-Time Maneuvers of Flexible Spacecraft. Yaakov Sharony and Leonard Meirovitch, *Virginia Polytechnic Institute and State University* (14, 2, p. 268) Article

G91-042 Selection of Component Modes for Flexible Multibody Simulation. John T. Spanos and Walter S. Tsuha, *California Institute of Technology* (14, 2, p. 278) Article

G91-043 Approximate Solutions for Vibrations of Deploying Appendages. S. Kalaycioglu and A. K. Misra, *McGill University, Canada* (14, 2, p. 287) Article based on AIAA Paper 88-4250 CP8811

G91-044 Modal Identities for Multibody Elastic Spacecraft. Hari B. Hablani, *Rockwell International* (14, 2, p. 294) Article

G91-045 Fractional Order State Equations for the Control of Viscoelastically Damped Structures. R. L. Bagley and R. A. Calico, *Air Force Institute of Technology, Wright-Patterson AFB* (14, 2, p. 304) Article based on AIAA Paper 89-1213 CP891

G91-046 Three-Dimensional Vibrations of Tethered Satellite Systems. Monica Pasca and Marcello Pignataro, *University of Rome*; and Angelo Luongo, *University of L'Aquila, Italy* (14, 2, p. 312) Article

G91-047 Resonances in the Despin Dynamics of Dual-Spin Spacecraft. A. C. Or, *Hughes Aircraft Company* (14, 2, p. 321) Article

G91-048 Anisotropic Stiffness Effect on Stability of a Magnetically Suspended Momentum Wheel. K. Tsuchiya and M. Inoue, *Mitsubishi Electric Corporation, Japan*; S. Akishita, *Ritsumeikan University, Japan*; A. Nakajima and Y. Ohkami, *National Aerospace Laboratory, Japan*; and C. Murakami, *Tokyo Metropolitan Institute of Technology, Japan* (14, 2, p. 330) Article based on AIAA Paper 89-0545

G91-049 Turbofan Engine Demonstration of Sensor Failure Detection. Walter C. Merrill, John C. DeLaat and Mahmood Abdelwahab, *NASA Lewis Research Center* (14, 2, p. 337) Article

G91-050 Experimental Results Using Active Control of Traveling Wave Power Flow. David W. Miller and Steven R. Hall, *Massachusetts Institute of Technology* (14, 2, p. 350) Article

G91-051 Application of Singular Perturbation Methods for Three-Dimensional Minimum-Time Interception. Donglong Sheu, *National Cheng-Kung University, Taiwan, ROC*; Nguyen X. Vinh and Robert M. Howe, *University of Michigan* (14, 2, p. 360) Article

G91-052 Optimal Aeroassisted Guidance Using Loh's Term Approximations. W. M. McEneaney, *Jet Propulsion Laboratory, California Institute of Technology* (14, 2, p. 368) Article based on AIAA Paper 89-3548 CP899

G91-053 Optimal Thrust Control of a Missile with a Pulse Motor. Fumiaki Imado and Takeshi Kuroda, *Mitsubishi Electric Corporation, Japan*; and Susumu Miwa, *Tokyo Denki University, Japan* (14, 2, p. 377) Article based on AIAA Paper 89-3479 CP899

G91-054 Optimal Rigid-Body Motions. Rajiv S. Chowdhry, Eugene M. Cliff and Frederick H. Lutze, *Virginia Polytechnic Institute and State University* (14, 2, p. 383) Article based on AIAA Paper 89-3616 CP899

G91-055 Perfect Explicit Model-Following Control Solution to Imperfect Model-Following Control Problems. Wayne C. Durham and Frederick H. Lutze, *Virginia Polytechnic Institute and State University* (14, 2, p. 391) Article based on AIAA Paper 89-3612 CP899

G91-056 Conditional Performance Error Covariance Analyses for Commercial Titan Launch Vehicles. Prabhakara P. Rao and Stephen C. Bell, *Martin Marietta Corporation* (14, 2, p. 398) Article based on AIAA Paper 89-3447 CP899

G91-057 Near-Minimum-Time Control of Distributed Parameter Systems: Analytical and Experimental Results. J. L. Junkins, Z. H. Rahman and H. Bang, *Texas A&M University* (14, 2, p. 406) Article

G91-058 Robust Eigenspace Assignment Using Singular Value Sensitivities. Sanjay Garg, *Sverdrup Technology, Inc., Lewis Research Center Group* (14, 2, p. 416) Article

G91-059 Covariance Analysis Algorithm for Interconnected Systems. Robert D. Curley, *Integrated Systems, Inc.*; Victor H. L. Cheng, *NASA Ames Research Center*; and Ching-An Lin, *National Chiao Tung University, Taiwan, ROC* (14, 2, p. 425) Article based on AIAA Paper 87-2583 CP878

G91-060 Trajectory Optimization on a Parallel Processor. John T. Betts and William P. Huffman, *Boeing Computer Services* (14, 2, p. 431) Article based on AIAA Paper 89-3613 CP899

G91-061 Optimal Aircraft Performance During Microburst Encounter. Mark L. Psiaki, *Cornell University*; and Robert F. Stengel, *Princeton University* (14, 2, p. 440) Article based on AIAA Paper 88-4367 CP8810

G91-062 Application of Total Energy Control for High-Performance Aircraft Vertical Transitions. Anthony Warren, *Boeing Company* (14, 2, p. 447) Article based on AIAA Paper 89-3559 CP899

G91-063 Analytical Prediction of Height-Velocity Diagram of a Helicopter Using Optimal Control Theory. Yoshinori Okuno, Keiji Kawachi and Akira Azuma, *University of Tokyo*; and Shigeru Saito, *National Aerospace Laboratory, Japan* (14, 2, p. 453) Article

G91-064 Nonlinear Dynamical Model of Relative Motion for the Orbiting Debris Problem. Richard S. Hujsak, *Applied Technology Associates, Inc.* (14, 2, p. 460) Article

G91-065 Design of Optimal Second-Order State Estimators. Suresh M. Joshi, *NASA Langley Research Center* (14, 2, p. 466) Engineering Note

G91-066 Feedback Tether Deployment and Retrieval. Srinivas R. Vadali, *Texas A&M University* (14, 2, p. 469) Engineering Note

G91-067 Mission Function Control of Tethered Subsatellite Deployment/Retrieval: In-Plane and Out-of-Plane Motion. Hironori Fujii, Kenji Uchiyama and Kentaro Kokubun, *Tokyo Metropolitan Institute of Technology* (14, 2, p. 471) Engineering Note

G91-068 Fast Orbit Propagator for Graphical Display. F. Landis Markley and James F. Jeletic, *NASA Goddard Space Flight Center* (14, 2, p. 473) Engineering Note

G91-069 Adaptive Noise Models for Extended Kalman Filter. K. Kumar, D. Yadav and B. V. Srinivas, *Indian Institute of Technology, India* (14, 2, p. 475) Engineering Note

G91-070 New Star Identification Technique for Attitude Control. B. V. Sheela, Chandra Shekhar, P. Padmanabhan and M. G. Chandrasekhar, *Indian Space Research Organization Satellite Centre, India* (14, 2, p. 477) Engineering Note

G91-071 Evolution of Airplane Stability and Control: A Designer's Viewpoint (HKT). Jan Roskam, *University of Kansas* (14, 3, p. 481) Article

G91-072 Multistage Design of an Optimal Momentum Management Controller for the Space Station. J. W. Sunkel, *NASA Johnson Space Center*; and L. S. Shieh, *University of Houston* (14, 3, p. 492) Article based on AIAA Paper 90-3316 CP909

G91-073 Hierarchic Control Architecture for Intelligent Structures. Steven R. Hall, Edward F. Crawley and Jonathan P.

How, *Massachusetts Institute of Technology*; and Benjamin Ward, *Tektronix, Inc.* (14, 3, p. 503) Article based on AIAA Paper 90-3362 CP909

G91-074 H^∞ Robust Control Synthesis for a Large Space Structure. Michael G. Safonov, Richard Y. Chiang and Henryk Flashner, *University of Southern California* (14, 3, p. 513) Article

G91-075 Control of Uncertain Structures Using an H_∞ Power Flow Approach. Douglas G. MacMartin and Steven R. Hall, *Massachusetts Institute of Technology* (14, 3, p. 521) Article

G91-076 Unified Formulation of Dynamics for Serial Rigid Multibody Systems. Abhinandan Jain, *Jet Propulsion Laboratory/California Institute of Technology* (14, 3, p. 531) Article

G91-077 Attitude Acquisition System for Communication Spacecraft. M. Schwarzschild and S. Rajaram, *GE Astro Space Division* (14, 3, p. 543) Article based on AIAA Paper 89-3605 CP899

G91-078 New Method for Scanning Spacecraft and Balloon-Borne/Space-Based Experiments. Michael E. Polites, *NASA Marshall Space Flight Center* (14, 3, p. 548) Article

G91-079 Fault-Tolerant Parallel Processor. Richard E. Harper and Jaynarayan H. Lala, *Charles Stark Draper Laboratory* (14, 3, p. 554) Article

G91-080 Integration of Four-Dimensional Guidance with Total Energy Control System. Isaac Kaminer and Patrick O'Shaughnessy, *Boeing Company* (14, 3, p. 564) Article based on AIAA Paper 88-4067 CP889

G91-081 Hypervelocity Orbital Intercept Guidance Using Certainty Control. Salvatore Alfano, *United States Air Force Academy*; and Charles E. Fosha Jr., *University of Colorado* (14, 3, p. 574) Article

G91-082 Adaptive Two-Time-Scale Tracking Filter for Target Acceleration Estimation. Stephan A. R. Hepner and Hans P. Geering, *Swiss Federal Institute of Technology, Switzerland* (14, 3, p. 581) Article

G91-083 Optimal Guidance for High-Order and Acceleration Constrained Missile. Ilan Rusnak and Levi Meir, *Rafael, Israel* (14, 3, p. 589) Article

G91-084 Singular Value Robustness Tests for Missile Autopilot Uncertainties. Kevin A. Wise, *McDonnell Douglas Missile Systems Company* (14, 3, p. 597) Article based on AIAA Paper 89-3552 CP899

G91-085 Stability Robustness Margin Computation for Structured Real-Parameter Perturbations. Evan Wedell, C.-H. Chuang and Bong Wie, *University of Texas at Austin* (14, 3, p. 607) Article based on AIAA Paper 89-3504 CP899

G91-086 Robust Eigenvalue Assignment with Maximum Tolerance to System Uncertainties. L. H. Keel, *Tennessee State University*; Kyong B. Lim and Jer-Nan Juang, *NASA Langley Research Center* (14, 3, p. 615) Article based on AIAA Paper 89-3611 CP899

G91-087 Robust Eigenstructure Assignment with Structured State Space Uncertainty. Wangling Yu and Kenneth M. Sobel, *City College of New York* (14, 3, p. 621) Article

G91-088 Singular-Value Based Stability and Sensitivity Analysis of Discrete Multiloop Systems. Chee Woo Kang and Kwae Hi Lee, *Sogang University, Korea* (14, 3, p. 629) Article

G91-089 Stability Analysis of Digital Kalman Filters with Floating-Point Computation. Chih-Tsung Kuo, *Tatung Institute of Technology, Taiwan, ROC*; Bor-Sen Chen, *National Tsing Hua University, Taiwan, ROC*; and Zeal-Sain Kuo, *Chung Cheng Institute of Technology, Taiwan, ROC* (14, 3, p. 636) Article

G91-090 Application of Multiple-Input/Single-Output Analysis Procedures to Flight Test Data. J. K. Sridhar, *National Aeronautical Laboratory, India*; and G. Wulff, *Deutsche Forschungsanstalt für Luft- und Raumfahrt, Germany* (14, 3, p. 645) Article

G91-091 Superimposed Perspective Visual Cues for Helicopter Hovering Above a Moving Ship Deck. M. Negrin, A. J. Grunwald and A. Rosen, *Technion—Israel Institute of Technology* (14, 3, p. 652) Article

G91-092 Computational Singular Perturbation Method for Dynamic Systems. Mark D. Ardema, *Santa Clara University* (14, 3, p. 661) Engineering Note

G91-093 Modeling Error Bounds for Flexible Structures with Application to Robust Control. Yossi Chait, *University of Massachusetts* (14, 3, p. 665) Engineering Note

G91-094 Orbital Motion Under Continuous Radial Thrust. Frederick W. Boltz, *NASA Ames Research Center* (14, 3, p. 667) Engineering Note

G91-095 Trajectory Design for Robotic Manipulators in Space Applications. C. W. de Silva, *University of British Columbia, Canada* (14, 3, p. 670) Engineering Note

G91-096 Jacobi Method for Unsymmetric Eigenproblems. Leon Chahinian, *McDonnell Douglas Corporation* (14, 3, p. 674) Engineering Note

G91-097 Generalized Proportional-Plus-Derivative Compensators for a Class of Uncertain Plants. Suresh M. Joshi, *NASA Langley Research Center* (14, 3, p. 677) Engineering Note

G91-098 Order-Variable Adaptive Pole-Placement Controllers for a Flexible System. Faryar Jabbari and Yongming Gu, *University of California at Irvine* (14, 3, p. 680) Engineering Note

G91-099 Application of Encke's Method to Long Arc Orbit Determination Solutions. J. B. Lundberg, B. E. Schutz, R. K. Fields and M. M. Watkins, *University of Texas at Austin* (14, 3, p. 683) Engineering Note based on AIAA Paper 89-0460

G91-100 Experimental Modal Analysis for Dynamic Models of Spacecraft. Keiji Komatsu, Masaaki Sano and Takashi Kai, *National Aerospace Laboratory, Japan*; Akio Tsujihata and Hidehiko Mitsuma, *National Space Development Agency of Japan* (14, 3, p. 686) Engineering Note

G91-101 Dynamic Evaluation of the NASA-ORNL Traction-Drive Joint. Clarence W. de Silva, *University of British Columbia, Canada*; and Walter W. Hankins III, *NASA Langley Research Center* (14, 3, p. 688) Engineering Note

G91-102 Model Reduction for Flexible Structures: Test Data Approach. Wodek Gawronski, *Jet Propulsion Laboratory, California Institute of Technology* (14, 3, p. 692) Engineering Note

G91-103 Angle-Only Tracking Filter in Modified Spherical Coordinates. David V. Stallard, *Raytheon Company* (14, 3, p. 694) Engineering Note based on AIAA Paper 87-2380 CP878

G91-104 Stability Regions of a Model Reference Control System. Per Persson, *Lund Institute of Technology, Sweden* (14, 3, p. 697) Engineering Note

G91-105 Low-Authority Eigenvalue Placement for Second-Order Structural Systems. Nelson G. Creamer, *Swales and Associates, Inc.*; and John L. Junkins, *Texas A&M University* (14, 3, p. 698) Engineering Note

G91-106 Lateral-Direction Tracking Requirements from Simulation Data. Mario Innocenti, *Auburn University*; and Renzo Bava, *Aeritalia SAIpa, Italy* (14, 3, p. 701) Engineering Note

G91-107 Rocket Trajectory Optimization: 1950-1963 (HKT). Derek F. Lawden, *University of Aston, England, UK* (14, 4, p. 705) Article

G91-108 Digital Redesign of an Optimal Momentum Management Controller for the Space Station. J. W. Sunkel, *NASA Johnson Space Center*; L. S. Shieh and J. L. Zhang, *University of Houston* (14, 4, p. 712) Article based on AIAA Paper 89-3473 CP899

G91-109 Reorientation Maneuver for Spinning Spacecraft. Christopher D. Rahn, *University of California, Berkeley*; and Peter M. Barba, *Ford Aerospace Corporation* (14, 4, p. 724) Article

G91-110 Feedback Control of Tethered Satellites Using Lyapunov Stability Theory. S. R. Vadali and E.-S. Kim, *Texas A&M University* (14, 4, p. 729) Article based on AIAA Paper 90-1197 CP903

G91-111 Modeling of the Slewing Control of a Flexible Structure. Ephraim Garcia and Daniel J. Inman, *State University of New York at Buffalo* (14, 4, p. 736) Article

G91-112 Identification of a Tendon Control System for Flexible Space Structures. Yoshisada Murotsu, Hiroshi Okubo and Kei Senda, *University of Osaka Prefecture, Japan* (14, 4, p. 743) Article based on AIAA Paper 89-3568 CP899

G91-113 Stability of an Asymmetric Dual-Spin Spacecraft with Flexible Platform. Z. Viderman, *Rafael Institute, Israel*; F. P. J. Rimrott and W. L. Cleghorn, *University of Toronto, Canada* (14, 4, p. 751) Article

G91-114 Transient Solution of Time-Variant Structural Systems Using Invariant Modal Properties. Edwin E. Henkel, René A. Hewlett and Raymond Mar, *Rockwell International* (14, 4, p. 761) Article

G91-115 Critical Mode Interaction in the Presence of External Random Excitation. G. Leng and N. Sri Namachchivaya, *University of Illinois* (14, 4, p. 770) Article

G91-116 Classical Control System Design and Experiment for the Mini-Mast Truss Structure. Bong Wie, *Arizona State University*; Lucas Horta and Jeff Sulla, *NASA Langley Research Center* (14, 4, p. 778) Article

G91-117 Modal Truncation, Ritz Vectors, and Derivatives of Closed-Loop Damping Ratios. Chris A. Sandridge and Raphael T. Haftka, *Virginia Polytechnic Institute and State University* (14, 4, p. 785) Article

G91-118 Use of Negative Weights in Linear Quadratic Regulator Synthesis. H. Ohta and M. Kakinuma, *Nagoya University, Japan*; and P. N. Nikiforuk, *University of Saskatchewan, Canada* (14, 4, p. 791) Article

G91-119 Optimal Plane Change During Constant Altitude Hypersonic Flight. K. D. Mease, *Princeton University*; N. X. Vinh and S. H. Kuo, *University of Michigan* (14, 4, p. 797) Article based on AIAA Paper 88-4341 CP8810

G91-120 Optimal Trajectory Synthesis for Terrain-Following Flight. P. K. A. Menon and E. Kim, *Georgia Institute of Technology*; and V. H. L. Cheng, *NASA Ames Research Center* (14, 4, p. 807) Article

G91-121 Dynamic Interpolation and Application to Flight Control. Joseph W. Jackson, *Honeywell, Inc.*; and Peter E. Crouch, *Arizona State University* (14, 4, p. 814) Article

G91-122 Onboard Automatic Aid and Advisory for Pilots of Control-Impaired Aircraft. Elaine A. Wagner, *General Dynamics* (14, 4, p. 823) Article based on AIAA Paper 89-3460 CP899

G91-123 Ascent Performance of an Air-Breathing Horizontal-Takeoff Launch Vehicle. Richard W. Powell, John D. Shaughnessy, Christopher I. Cruz and J. Christopher Naftel, *NASA Langley Research Center* (14, 4, p. 834) Article

G91-124 Identifiability of Helicopter Models Incorporating Higher-Order Dynamics. Stewart S. Houston, *Royal Aerospace Establishment, England, UK*; and Colin G. Black, *University of Glasgow, Scotland, UK* (14, 4, p. 840) Article

G91-125 Design and Evaluation of an Air Traffic Control Final Approach Spacing Tool. Thomas J. Davis, Heinz Erzberger and Steven M. Green, *NASA Ames Research Center*; and William Nedell, *San Jose State University* (14, 4, p. 848) Article

G91-126 Gravity Gradient Stability of Satellites with Guy-Wire Constrained Appendages. Andre P. Mazzoleni and A. L. Schlack, *University of Wisconsin* (14, 4, p. 855) Engineering Note

G91-127 Results in Identification of a Flexible Structure Using Lattice Filters. M. D. Roesler, *TRW Space and Defense Group*; and F. Jabbari, *University of California at Irvine* (14, 4, p. 857) Engineering Note

G91-128 Dynamic Decrease of Drag by Optimal Periodic Control. Gottfried Sachs, *Technische Universität München, Germany* (14, 4, p. 860) Engineering Note

G91-130 Time-to-Go Prediction for Homing Missiles Based on Minimum-Time Intercepts. David G. Hull, Jerry J. Radke and Rodney E. Mack, *University of Texas at Austin* (14, 5, p. 865) Article

G91-131 Postflight Data-Reduction Techniques for Hovered Kinetic Energy Weapons. Minjea Tahk and Tom Trikas, *Integrated Systems Inc.*; and Bryan Wallace, *USAF Astronautics Laboratory, Edwards AFB* (14, 5, p. 872) Article based on AIAA Paper 89-3372 CP898

G91-132 Assigning Controllability and Observability Gramians in Feedback Control. Kazunori Yasuda, *Kobe University, Japan*; and Robert E. Skelton, *Purdue University* (14, 5, p. 878) Article based on AIAA Paper 90-3502 CP909

G91-133 Controllability and Observability of Gyroelastic Vehicles. C. J. Damaren, *Royal Roads Military College, Canada*; and G. M. T. D'Eleuterio, *University of Toronto, Canada* (14, 5, p. 886) Article

G91-134 Measure of Controllability for Actuator Placement. Youdan Kim and John L. Junkins, *Texas A&M University* (14, 5, p. 895) Article

G91-135 Design of Restructurable Flight Control Systems Using Feedback Linearization. Yoshimasa Ochi and Kimio Kanai, *National Defense Academy, Japan* (14, 5, p. 903) Article

G91-136 Error Dynamics and Perfect Model Following with Application to Flight Control. Mark R. Anderson, *Systems Control Technology, Inc.*; and David K. Schmidt, *Arizona State University* (14, 5, p. 912) Article based on AIAA Paper 87-2311 CP878

G91-137 Generalized Technique for Inverse Simulation Applied to Aircraft Maneuvers. R. A. Hess, C. Gao and S. H. Wang, *University of California, Davis* (14, 5, p. 920) Article

G91-138 Design of a Total Energy Control Autopilot Using Constrained Parameter Optimization. Christopher Voth, *Martin Marietta*; and Uy-Loi Ly, *University of Washington* (14, 5, p. 927) Article

G91-139 Precise Flight-Path Control Using a Predictive Algorithm. Y. C. Jung and R. A. Hess, *University of California, Davis* (14, 5, p. 936) Article

G91-140 Numerical and Literal Aeroelastic-Vehicle-Model Reduction for Feedback Control Synthesis. Brett Newman and David K. Schmidt, *Arizona State University* (14, 5, p. 943) Article

G91-141 Flying Quality Analysis and Flight Evaluation of a Highly Augmented Combat Rotorcraft. Mark B. Tischler, Jay W. Fletcher, Patrick M. Morris and George E. Tucker, *NASA Ames Research Center* (14, 5, p. 954) Article

G91-142 Generalized Covariance Analysis for Partially Autonomous Deep Space Missions. Jack N. Boone, *Martin Marietta Corporation* (14, 5, p. 964) Article

G91-143 Approach for Targeting Landers and Penetrators Using Orbital Optical Navigation. Tseng-Chan Wang, Thomas C. Duxbury and Stephen P. Synnott, *Jet Propulsion Laboratory, California Institute of Technology*; and Kathleen Edwards, *U.S. Geological Survey* (14, 5, p. 973) Article

G91-144 Optimal Finite-Thrust Spacecraft Trajectories Using Collocation and Nonlinear Programming. Paul J. Enright and Bruce A. Conway, *University of Illinois at Urbana-Champaign* (14, 5, p. 981) Article

G91-145 Mission Function Control for a Slew Maneuver Experiment. Hironori Fujii, Toshiyuki Ohtsuka and Satoshi Udou, *Tokyo Metropolitan Institute of Technology, Japan* (14, 5, p. 986) Article

G91-146 Active Vibration Control with Model Correction on a Flexible Laboratory Grid Structure. George C. Schamel II and Raphael T. Haftka, *Virginia Polytechnic Institute and State University* (14, 5, p. 993) Article

G91-147 Integrated Structure/Control Law Design by Multi-level Optimization. Michael G. Gilbert, *NASA Langley Research Center*; and David K. Schmidt, *Arizona State University* (14, 5, p. 1001) Article based on AIAA Paper 89-3470 CP899

G91-148 Hybrid State Equations of Motion for Flexible Bodies in Terms of Quasi-Coordinates. Leonard Meirovitch, *Virginia Polytechnic Institute and State University* (14, 5, p. 1008) Article

G91-149 Constrained Eigensystem Realization Algorithm for Lightly Damped Distributed Structures. Mark A. Norris, *Virginia Polytechnic Institute and State University* (14, 5, p. 1014) Article

G91-150 Optical Modeling for Dynamics and Control Analysis. David C. Redding, *Charles Stark Draper Laboratory*; and William G. Breckenridge, *Jet Propulsion Laboratory, California Institute of Technology* (14, 5, p. 1021) Article based on AIAA Paper 90-3383 CP909

G91-151 Design Criteria for Predicting Damping in Underdamped Linear Lumped-Parameter Systems. Alpha D. S. Ross and Daniel J. Inman, *State University of New York at Buffalo* (14, 5, p. 1033) Article

G91-152 Stability of Second-Order Multidimensional Linear Time-Varying Systems. Ping Hsu, *San Jose State University*; and Jinnwen Wu, *University of Illinois at Urbana-Champaign* (14, 5, p. 1040) Article

G91-153 Partially Filled Nutation Damper for a Freely Precessing Gyroscope. C. O. Chang and C. S. Chou, *National Taiwan University, Taiwan, ROC* (14, 5, p. 1046) Article

G91-154 Modern Guidance Law for High-Order Autopilot. Ilan Rusnak and Levi Meir, *RAFAEL, Israel* (14, 5, p. 1056) Engineering Note

G91-155 Optimal Nonlinear Compensator. Moti Shefer and John V. Breakwell, *Stanford University* (14, 5, p. 1058) Engineering Note

G91-156 Derivation of the Relative Quaternion Differential Equation. S. Vathsar, *Osmania University, India* (14, 5, p. 1061) Engineering Note

G91-157 Existence and Uniqueness Proof for the Minimum Model Error Optimal Estimation Algorithm. D. Joseph Mook, *State University of New York at Buffalo*; and Jiannshun Lew, *NASA Langley Research Center* (14, 5, p. 1064) Engineering Note

G91-158 Compensating Sampling Errors in Stabilizing Helmet-Mounted Displays Using Auxiliary Acceleration Measurements. S. Merhav and M. Velger, *Technion—Israel Institute of Technology* (14, 5, p. 1067) Engineering Note

G91-159 True Anomaly Approximation for Elliptical Orbits. Randall D. Peters, *Texas Tech University* (14, 5, p. 1069) Engineering Note

G91-160 Estimating Retrosensor Position from Range Data. A. W. Merz, *Lockheed Missiles & Space Company* (14, 5, p. 1071) Engineering Note

G91-161 Dominance of Stiffening Effects for Rotating Flexible Beams. C. Smith and H. Baruh, *Rutgers University* (14, 5, p. 1072) Engineering Note

G91-162 Linear Quadratic Regulator Approach to the Stabilization of Matched Uncertain Linear Systems. Y. J. Wang and L. S. Shieh, *University of Houston*; and J. W. Sunkel, *NASA Johnson Space Center* (14, 5, p. 1074) Engineering Note

G91-163 Analysis of a Rotationally Accelerated Beam with Finite Tip Mass and Hub. K. Moesslacher Jr., J. C. Bruch Jr. and T. P. Mitchell, *University of California at Santa Barbara* (14, 5, p. 1077) Engineering Note

G91-164 Guidance for Asteroid Rendezvous. M. Guelman, *RAFAEL, Israel* (14, 5, p. 1080) Engineering Note

G91-165 Stabilization via Dynamic Output Feedback: A Numerical Approach. W. E. Schmitendorf, *University of California, Irvine*; and W. Schirm, *University of Stuttgart, Germany* (14, 5, p. 1083) Engineering Note

G91-166 Algebraic Approach to the Bearings-Only Estimation Equations. Walter Grossman, *Loral Electronic Systems* (14, 5, p. 1086) Engineering Note

G91-167 Retrospective Essay on Nonlinearities in Aircraft Flight Control (HKT). Dunstan Graham, *Graham-Metsys, Inc.*; and Duane McRuer, *Systems Technology, Inc.* (14, 6, p. 1089) Article

G91-168 Experimental Investigation of Passive Enhancement of Damping for Space Structures. Nesbitt W. Hagood and Edward F. Crawley, *Massachusetts Institute of Technology* (14, 6, p. 1100) Article based on AIAA Paper 89-3436 CP899

G91-169 Experimental Analysis of a Passively Tuned Actuator on a Low-Order Structure. Steven G. Webb and Jeffrey S. Turcotte, *U.S. Air Force Academy* (14, 6, p. 1110) Article

G91-170 Robust H_∞ Control Design for the Space Station with Structured Parameter Uncertainty. Kuk-Whan Byun and Bong Wie, *Arizona State University*; David Geller and John Sunkel, *NASA Johnson Space Center* (14, 6, p. 1115) Article based on AIAA Paper 90-3319 CP909

G91-171 Dynamics of an Antenna Pointing Control System with Flexible Structures. Masazumi Ueba, *Nippon Telegraph and Telephone Corporation, Japan* (14, 6, p. 1123) Article based on AIAA Paper 90-2951 CP907

G91-172 Dynamics of a Tethered Satellite Subjected to Aerodynamic Forces. Guido de Matteis and Luciano M. de Socio, *University of Rome, "La Sapienza," Italy* (14, 6, p. 1129) Article based on AIAA Paper 90-0656

G91-173 Design of a Viscous Ring Nutation Damper for a Freely Precessing Body. C. O. Chang and C. S. Chou, *National Taiwan University, Taiwan, ROC*; and S. Z. Wang, *Chung Shan Institute of Science and Technology, Taiwan, ROC* (14, 6, p. 1136) Article

G91-174 Dynamics of Hang Gliders. Guido de Matteis, *University of Rome, "La Sapienza," Italy* (14, 6, p. 1145) Article

G91-175 Symbolic Computer Language for Multibody Systems. Michael W. Sayers, *University of Michigan Transportation Research Institute* (14, 6, p. 1153) Article

G91-176 Autonomously Aided Strapdown Attitude Reference System. M. Koifman and S. J. Merhav, *Technion—Israel Institute of Technology* (14, 6, p. 1164) Article

G91-177 Adaptive Suppression of Biodynamic Interference in Helmet-Mounted Displays and Head Teleoperation. S. Lifshitz and S. J. Merhav, *Technion—Israel Institute of Technology* (14, 6, p. 1173) Article

G91-178 Rapid Near-Optimal Aerospace Plane Trajectory Generation and Guidance. J. E. Corban, A. J. Calise and G. A. Flandro, *Georgia Institute of Technology* (14, 6, p. 1181) Article

G91-179 Robust Non-Minimum-Phase Compensation for a Class of Uncertain Dynamical Systems. Kuk-Whan Byun and Bong Wie, *Arizona State University*; and John Sunkel, *NASA Johnson Space Center* (14, 6, p. 1191) Article based on AIAA Paper 89-3516 CP899

G91-180 Control of Distributed Parameter Systems by Moving Force Actuators. Slim Choura, *King Saud University, Saudi Arabia*; and Suhada Jayasuriya, *Texas A&M University* (14, 6, p. 1200) Article

G91-181 Parameter Insensitive Control Utilizing Eigenspace Methods. Robert E. Fennell, *Clemson University*; William M. Adams Jr., *NASA Langley Research Center*; and David M. Christhilf, *Lockheed Engineering and Sciences Company* (14, 6, p. 1208) Article based on AIAA Paper 88-4099 CP889

G91-182 Optimal Control Problems with Maximum Functional. Ping Lu, *Iowa State University*; and Nguyen X. Vinh, *University of Michigan* (14, 6, p. 1215) Article

G91-183 Homotopy Approach to Optimal, Linear Quadratic, Fixed Architecture Compensation. Mathieu Mercadal, *Massachusetts Institute of Technology* (14, 6, p. 1224) Article

G91-184 Explicit Exponential Method for the Integration of Stiff Ordinary Differential Equations. Sami S. Ashour and Owen T. Hanna, *University of California, Santa Barbara* (14, 6, p. 1234) Article

G91-185 Symbolic Vector/Dyadic Multibody Formalism for Tree-Topology Systems. Michael W. Sayers, *University of Michigan Transportation Research Institute* (14, 6, p. 1240) Article

G91-186 Application of Stochastic Robustness to Aircraft Control Systems. Laura Ryan Ray and Robert F. Stengel, *Princeton University* (14, 6, p. 1251) Article

G91-187 Structure/Control Design Synthesis of Active Flutter Suppression System by Goal Programming. Shinji Suzuki and Seiji Matsuda, *University of Tokyo, Japan* (14, 6, p. 1260) Article

G91-188 Application of Aeroservoelastic Modeling Using Minimum-State Unsteady Aerodynamic Approximations. Sherwood T. Hoadley, *NASA Langley Research Center*; and Mordechay Karpel, *Technion—Israel Institute of Technology* (14, 6, p. 1267) Article based on AIAA Paper 89-1188 CP891

G91-189 Roll-Performance Criteria for Highly Augmented Aircraft. Mario Innocenti and Ajay Thukral, *Auburn University* (14, 6, p. 1277) Article

G91-190 Nonlinear Control of a Twin-Lift Helicopter Configuration. P. K. A. Menon, J. V. R. Prasad and D. P. Schrage, *Georgia Institute of Technology* (14, 6, p. 1287) Article

G91-191 Helicopter Air Resonance Modeling and Suppression Using Active Control. M. D. Takahashi and P. P. Friedmann, *University of California, Los Angeles* (14, 6, p. 1294) Article

G91-192 Time-Periodic Control of a Multiblade Helicopter. Steven G. Webb, *United States Air Force Academy*; Robert A. Calico and William E. Wiesel, *Air Force Institute of Technology, Wright-Patterson AFB* (14, 6, p. 1301) Article based on AIAA Paper 89-3449 CP899

G91-193 Orbital Dynamics of the Hanging Tether Interferometer. Anthony B. DeCou, *Northern Arizona University* (14, 6, p. 1309) Engineering Note

G91-194 Krylov Model Reduction Algorithm for Undamped Structural Dynamics Systems. Tzu-Jeng Su and Roy R. Craig Jr., *University of Texas at Austin* (14, 6, p. 1311) Engineering Note

G91-195 Optimal Feedback Gains for Three-Dimensional Large Angle Slewing of Spacecraft. Arun K. Banerjee, *Lockheed Missiles & Space Company* (14, 6, p. 1313) Engineering Note

G91-196 Statistical Linearization for Multi-Input/Multi-Output Nonlinearities. Ching-An Lin, *National Chiao-Tung University, Taiwan, ROC*; and Victor H. L. Cheng, *NASA Ames Research Center* (14, 6, p. 1315) Article

G91-197 Constant Covariance in Local Vertical Coordinates for Near-Circular Orbits. Stanley W. Shepperd, *Charles Stark Draper Laboratory, Inc.* (14, 6, p. 1318) Engineering Note

G91-198 Optimal In-Plane Orbital Evasive Maneuvers Using Continuous Low Thrust Propulsion. J. W. Widhalm, *U.S. Space Command Headquarters, Peterson AFB*; and S. A. Heise, *Air Force Flight Dynamics Laboratory, Wright-Patterson AFB* (14, 6, p. 1323) Engineering Note based on AIAA Paper 88-0374

G91-199 Optimal Test Procedures for Evaluating Circular Probable Error. Mohammad-Ali Massoumnia, *Sharif University of Technology, Iran* (14, 6, p. 1326) Engineering Note