Subject Index

Aircraft Technology, Conventional, STOL/VTOL

Aerodynamics

Prediction of Tubular Projectile Aerodynamics Using the ZEUS Euler Code

189-048

Aerodynamic Characteristics of Configurations Having Bodies with Square, Rectangular, and Circular Cross Sections

A89-011

Interactive Approach to Surface Fitting Complex Geometries for Flowfield Applications A89-004

Supersonic, Transverse Jet from a Rotating Ogive Cylinder in a Hypersonic Flow A89-003

Aeroelasticity and Aeroservoelasticity

Aeroelastic Analysis of Launch Vehicles in Transonic Flight A89-002

Configuration Design

Wing-Body Interference Lift for Supersonic Missiles with Elliptical Cross-Section Fusclages

A89-049

Reusable, Flyback Liquid Rocket Booster for the Space Shuttle A89-037 Wing Vertical Position Effects on Lift for Supersonic Delta Wing Missiles A89-031

Flight Operations

Dynamic Display of Electronic Crew Procedures for Space Station A89-005

Energy

Photovoltaic Power

Photochemical Spacecraft Self-Contamination: Laboratory Results and Systems Impacts A89-054

Fluid Dynamics

Boundary-Layer Stability and Transition

Interactive Approach to Surface Fitting Complex Geometries for Flowfield Applications A89-004

Computational Fluid Dynamics

Modeling of the Space Shuttle Solid Rocket
Motor Nozzle Boot Cavity Pressurization
Process
A89-057
Flow-Thermal-Structural Study of Aerodynamically Heated Leading Edges A89-030

Three-Dimensional Hypersonic Nonequilibrium Flows at Large Angles of Attack
A89-023

Aeroelastic Analysis of Launch Vehicles in Transonic Flight A89-002

Prediction of Three-Dimensional Hypersonic Flows Using a Parabolized Navier-Stokes Scheme A89-001

Hypersonic Flow

Three-Dimensional Hypersonic Nonequilibrium Flows at Large Angles of Attack A89-023

Prediction of Three-Dimensional Hypersonic Flows Using a Parabolized Navier-Stokes Scheme A89-001

Inlet, Nozzle, Diffusor, and Channel Flows

Prediction of Tubular Projectile Aerodynamics Using the ZEUS Euler Code

A89-048

Nozzle-Lip Effects on Argon Expansions
Into the Plume Backflow A89-042
Aerodynamic Side Force Induced by Nozzle
Entrance Flow Asymmetry A89-032

Jets, Wakes, and Viscid-Inviscid Flow Interactions

Effects of Multiple Scattering on Rocket
Exhaust Plume Smoke Visibility A89-040
Supersonic, Transverse Jet from a Rotating
Ogive Cylinder in a Hypersonic Flow
A89-003

Rarefied Flows

Nozzle-Lip Effects on Argon Expansions
Into the Plume Backflow A89-042
Shuttle High Resolution Accelerometer
Package Experiment Results: Atmospheric
Density Measurements Between 60 and
160 km A89-025
Outer Atmospheric Research Using Tethered
Systems A89-008

Shock Waves and Detonations

Shock Wave Asymmetry of Sphere Cones at Angles of Attack A89-029

Supersonic Flow

Prediction of Tubular Projectile Aerodynamics Using the ZEUS Euler Code

A89-048

Drag Correlation and Predictions of Surface
Groove Drag for Kinetic Energy Projectiles
A89-047
Aerodynamic Side Force Induced by Nozzle

Entrance Flow Asymmetry A89-032
Flow-Thermal-Structural Study of Aerodynamically Heated Leading Edges A89-030
Shock Wave Asymmetry of Sphere Cones at Angles of Attack A89-029

Supersonic Noncircular Missile Computations A89-022

Viscous Non-boundary-Layer Flows

Three-Dimensional Hypersonic Nonequilibrium Flows at Large Angles of Attack A89-023

Prediction of Three-Dimensional Hypersonic Flows Using a Parabolized Navier-Stokes Scheme A89-001

Vortices

Aerodynamic Effects of a Turbulent Flowfield on a Vertically Launched Missile A89-064

Wave Motion and Sloshing

Validated Spherical Pendulum Model for Rotary Liquid Slosh A89-027

Guidance, Control, and Dynamics Technology

Flight Displays

Dynamic Display of Electronic Crew Procedures for Space Station A89-005

Missile Dynamics

Closed-Form Approach to Rocket-Vehicles
Aeroelastic Divergence A89-013
Supersonic, Transverse Jet from a Rotating
Ogive Cylinder in a Hypersonic Flow
A89-003

Spacecraft Dynamics

Quasistatic Shape Adjustment of a 15-Meter-Diameter Space Antenna A89-019

Spacecraft Guidance and Control

Solar Cycle Effects on the Upper Atmosphere: Implications for Satellite Drag
A89-063

Interdisciplinary Topics

Atmospheric and Space Sciences

Solar Cycle Effects on the Upper Atmosphere: Implications for Satellite Drag

A89-063

Solar Cycle Effects on Near-Earth Plasmas
and Space Systems

Solar Activity Cycle: History and Predic

Solar Activity Cycle: History and Predictions A89-059 Shuttle High Resolution Accelerometer

Package Experiment Results: Atmospheric Density Measurements Between 60 and 160 km

A89-025

Outer Atmospheric Research Using Tethered Systems A89-008

Human Factors

Moments Applied in the Rotation of Massive Objects in Shuttle Extravehicular Activity A89-043

Dynamic Display of Electronic Crew Procedures for Space Station A89-005

Lasers and Laser Applications

Method of Atmospheric Density Measurements During Shuttle Entry Using Ultraviolet-Laser Rayleigh Scattering A89-007

Reliability, Maintainability, and Logistics Support

Swept Frequency Type of Ultrasonic Inspection Method for Liner-Propellant Separations of the H-I Upper-Stage Motors A89-056

Rocket Motor Service Life Calculations Based on the First-Passage Method

Analytical and Experimental Investigations for Satellite Antenna Deployment Mechanisms A89-026

Research Facilities and Instrumentation

Consort 1 Sounding Rocket Flight A89-052
Space-Based Test-Bed Concept A89-036
Method of Atmospheric Density Measurements During Shuttle Entry Using Ultraviolet-Laser Rayleigh Scattering A89-007

Safety

Delamination-Based Approach Toward Fracture Control of Composite Spacecraft Structures A89-033

Sensor Systems

Interferometric Measurements of Re-Entry Vehicle Base Radius A89-006

Launch Vehicle and Missile (LV/M) Technology

Aerodynamics

Aerodynamic Effects of a Turbulent Flowfield on a Vertically Launched Missile

Wing-Body Interference Lift for Supersonic Missiles with Elliptical Cross-Section Fuselages A89-049

Drag Correlation and Predictions of Surface Groove Drag for Kinetic Energy Projectiles A89-047

Wing Vertical Position Effects on Lift for Supersonic Delta Wing Missiles A89-031 Flow-Thermal-Structural Study of Aerodynamically Heated Leading Edges A89-030

Shuttle High Resolution Accelerometer
Package Experiment Results: Atmospheric
Density Measurements Between 60 and
160 km
A89-025

Supersonic Noncircular Missile Computations A89-022

Aerodynamic Characteristics of Configurations Having Bodies with Square, Rectangular, and Circular Cross Sections A89-011

Aeroelastic Analysis of Launch Vehicles in Transonic Flight A89-002

Configurational Design

Integrated Launch and Emergency Entry Vehicle Concept A89-058 Wing-Body Interference Lift for Supersonic Missiles with Elliptical Cross-Section Fuselages A89-049

Reusable, Flyback Liquid Rocket Booster for the Space Shuttle A89-037

Size and Economics of Big Space Freighters
A89-035

Wing Vertical Position Effects on Lift for Supersonic Delta Wing Missiles A89-031

Launch Vehicle and Sounding Rocket Systems

Integrated Launch and Emergency Entry Vehicle Concept A89-058 Size and Economics of Big Space Freighters
A89-035

Rocket Nozzle Expansion Ratio Analysis for Dual-Fuel Earth-to-Orbit Vehicles

Simple Relations for Analysis of Airbreathing Launch Vehicles A89-017

Propulsion and Propellant Systems

Integrated Launch and Emergency Entry
Vehicle Concept

A89-058

Effects of Multiple Scattering on Rocket
Exhaust Plume Smoke Visibility

A89-040

Rocket Nozzle Expansion Ratio Analysis for
Dual-Fuel Earth-to-Orbit Vehicles

A89-028

Bubble Behaviors in a Slowly Rotating
Helium Dewar in a Gravity Probe-B
Spacecraft Experiment
A89-024

Testing, Flight and Ground

Swept Frequency Type of Ultrasonic Inspection Method for Liner-Propellant Separations of the H-I Upper-Stage Motors

Test-Analysis Correlation of the Space Shuttle Solid Rocket Motor Center Segment A89-039

Interferometric Measurements of Re-Entry Vehicle Base Radius A89-006

Propulsion

Airbreathing Propulsion

Simple Relations for Analysis of Airbreathing Launch Vehicles A89-017

Electric and Advanced Space Propulsion

Electric Propulsion for Constellation Deployment and Spacecraft Maneuvering A89-053

Spacecraft and Mission Design for the SP-100 Flight Experiment A89-015

Liquid Rocket Engines and Missile Systems

Size and Economics of Big Space Freighters

Rocket Nozzle Expansion Ratio Analysis for Dual-Fuel Earth-to-Orbit Vehicles A89-028

Solid Rocket Motors and Missile Systems

Predicting Redesigned Solid Rocket Motor Joint Volume Pressurization, Temperature Transients, and Ablation A89-067

Swept Frequency Type of Ultrasonic Inspection Method for Liner-Propellant Separations of the H-I Upper-Stage Motors

Effects of Multiple Scattering on Rocket Exhaust Plume Smoke Visibility A89-040 Test-Analysis Correlation of the Space Shuttle Solid Rocket Motor Center Segment A89-039

Space Technology

Aerobraking Configurations/ Aerothermodynamics

Atmospheric Environment During Maneuvering Descent from Martian Orbit

Mars Tethered Sample Return A89-044

Aerobraking Flight Mechanics

Atmospheric Environment During Maneuvering Descent from Martian Orbit

A89-050

Humans in Space/Life Support Systems, EVA

Moments Applied in the Rotation of Massive Objects in Shuttle Extravehicular Activity A89-043

Large Solar Flare Radiation Shielding Requirements for Manned Interplanetary Missions A89-018

Collision Matrix for Low Earth Orbit Satellites A89-012

Landers

Atmospheric Environment During Maneuvering Descent from Martian Orbit

A89-050

Mission Design and Analysis

Determining Characteristic Mass for Low-Earth-Orbiting Debris Objects A89-066
Electromagnetically Launched Microspacecraft for Space Science Missions A89-051
Mars Tethered Sample Return A89-044
Spacecraft and Mission Design for the
SP-100 Flight Experiment A89-015
Engineering Tethered Payloads for Magnetic
and Plasma Observations in Low Orbit
A89-010

Mission Trajectories (Earth and Interplanetary)

Determining Characteristic Mass for Low-Earth-Orbiting Debris Objects A89-066

Space Experiments

Effects of Crucible Wetting During Solidification of Immiscible Pb-Zn Alloys

A89-069

Electrodynamics of the Getaway Tether
Experiment A89-065
Consort 1 Sounding Rocket Flight A89-052
Electromagnetically Launched Microspacecraft for Space Science Missions

A89-051 Thermal Control of Space X-Ray Experiment A89-045

Space-Based Test-Bed Concept
Review of Electrodynamic Tethers for Space
Plasma Science
Bubble Behaviors in a Slowly
Helium Dewar in a Gravity
Spacecraft Experiment

A89-036
Review 6 For Space
A89-034
Rotating
Probe-B
A89-024

Particle Adhesion to Surfaces Under Vacuum A89-014

Space Processing

Effects of Crucible Wetting During Solidification of Immiscible Pb-Zn Alloys

A89-069

Consort I Sounding Rocket Flight A89-052
Bubble Behaviors in a Slowly Rotating
Helium Dewar in a Gravity Probe-B
Spacecraft Experiment A89-024

Space Systems

Heat Loads Due to the Space Particle
Environment A89-068
Determining Characteristic Mass for LowEarth-Orbiting Debris Objects A89-066
Solar Cycle Effects on Near-Earth Plasmas
and Space Systems A89-062
Solar Cycle Effects on Trapped Energetic
Particles A89-061
Electric Propulsion for Constellation Deployment and Spacecraft Maneuvering
A89-053

Electromagnetically Launched Microspacecraft for Space Science Missions

A89-051

Impact of Water Integration on Space Station Freedom Propellant Availability A89-038 Space-Based Test-Bed Concept A89-036 Review of Electrodynamic Tethers for Space Plasma Science A89-034 Data System with Distributed Processing for a Next Generation Satellite A89-016 Particle Adhesion to Surfaces Under Vac-A89-014 min Engineering Tethered Payloads for Magnetic and Plasma Observations in Low Orbit A89-010

Spacecraft Contamination/Sterilization

Photochemical Spacecraft Self-Contamination: Laboratory Results and Systems Impacts A89-054 Collision Matrix for Low Earth Orbit Satel-

Collision Matrix for Low Earth Orbit Satellites A89-012

Spacecraft Data Sensing, Processing, and Transmission

Analysis of a Low-Vapor-Pressure Cryogenic Propellant Tankage System A89-055

Data System with Distributed Processing for a Next Generation Satellite A89-016

Particle Adhesion to Surfaces Under Vacuum A89-014

Method of Atmospheric Density Measurements During Shuttle Entry Using Ultraviolet-Laser Rayleigh Scattering A89-007

Spacecraft Power

Electrodynamics of the Getaway Tether Experiment A89-065
Optimum Heat Rejection Temperatures for Spacecraft Heat Pumps A89-046
Review of Electrodynamic Tethers for Space Plasma Science A89-034

Spacecraft Propulsion System Integration

Electric Propulsion for Constellation Deployment and Spacecraft Maneuvering A89-053

Impact of Water Integration on Space Station Freedom Propellant Availability

Simple Relations for Analysis of Airbreathing Launch Vehicles A89-017
Spacecraft and Mission Design for the SP-100 Flight Experiment A89-015

Spacecraft Radiation Protection

Solar Cycle Effects on Trapped Energetic
Particles A89-061
Solar Proton Events During the Past Three
Solar Cycles A89-060

Spacecraft Sensor Systems

Electrodynamics of the Getaway Tether
Experiment A89-065
Solar Cycle Effects on Trapped Energetic
Particles A89-061
Spacecraft Interactions as Influenced by
Thermochemical Considerations A89-021

Spacecraft Structural Configuration, Design, and Analysis

Quasistatic Shape Adjustment of a 15-Meter-Diameter Space Antenna

Collision Matrix for Low Earth Orbit Satellites A89-012

Spacecraft Thermal Management

Heat Loads Due to the Space Particle
Environment A89-068
Optimum Heat Rejection Temperatures for
Spacecraft Heat Pumps A89-046
Thermal Control of Space X-Ray Experiment
A89-045

Spacecraft Interactions as Influenced by Thermochemical Considerations A89-021

Structural Mechanics and Materials

Aeroelasticity and Control

Closed-Form Approach to Rocket-Vehicles
Aeroelastic Divergence A89-013

Materials Structural Properties

Analysis of a Low-Vapor-Pressure Cryogenic
Propellant Tankage System
A89-055
Influence of Temperature on Structural
Joints with Designed-In Damping

A89-020

Structural Composite Materials

Delamination-Based Approach Toward Fracture Control of Composite Spacecraft Structures A89-033

Structural Design

Influence of Temperature on Structural Joints with Designed-In Damping

A89-020

Structural Durability (including Fatigue and Fracture, and Environmental Degradation)

Rocket Motor Service Life Calculations
Based on the First-Passage Method

A 89-0

Delamination-Based Approach Toward Fracture Control of Composite Spacecraft Structures A89-033

Structural Dynamics and Characterization

Test-Analysis Correlation of the Space Shuttle Solid Rocket Motor Center Segment A89-039

Analytical and Experimental Investigations for Satellite Antenna Deployment Mechanisms

A89-026
Influence of Temperature on Structural

Joints with Designed-In Damping

A89-020

Quasistatic Shape Adjustment of a 15-Meter-Diameter Space Antenna

A89-019

Thermophysics and Heat Transfer

Ablation, Pyrolysis, Thermal Decomposition and Degradation

Predicting Redesigned Solid Rocket Motor
Joint Volume Pressurization, Temperature
Transients, and Ablation
A89-067
Solar Cycle Effects on the Upper Atmosphere: Implications for Satellite Drag
A89-063

Computational Heat Transfer

Modeling of the Space Shuttle Solid Rocket Motor Nozzle Boot Cavity Pressurization Process A89-057

Melting/Solidification

Effects of Crucible Wetting During Solidification of Immiscible Pb-Zn Alloys

A89-069

Nonintrusive Diagnostics

Tether Satellite Potential for Rarefied Gas Aerodynamic Research A89-009

Thermal Control

Photochemical Spacecraft Self-Contamination: Laboratory Results and Systems Impacts A89-054 Optimum Heat Rejection Temperatures for Spacecraft Heat Pumps A89-046

Thermal Modeling and Analysis

Predicting Redesigned Solid Rocket Motor
Joint Volume Pressurization, Temperature
Transients, and Ablation A89-067
Modeling of the Space Shuttle Solid Rocket
Motor Nozzle Boot Cavity Pressurization
Process A89-057

Thermochemistry and Chemical Kinetics

Spacecraft Interactions as Influenced by Thermochemical Considerations A89-021