

# 2007 *Journal of Propulsion and Power* Index

## How to Use the Index

In the Subject Index, pages 1329–1335, each technical paper is listed under a maximum of three appropriate headings. Note the locating number in boldface type preceding each paper title, and use that number to find the paper in the Chronological Index. The Author Index, pages 1336–1337, lists all authors associated with a given technical paper. The locating numbers are identical to those in the Subject Index. The Chronological Index, pages 1338–1343, also lists all papers by their locating numbers. This listing contains titles, authors and their affiliations, and volume, issue number, and page where the paper appeared. It also gives the AIAA paper number, if any, on which the article was based. Comments, Replies, and Errata are listed directly beneath the paper to which they refer. If the paper to which they refer was published prior to 2007, that paper also will appear in both the Subject and Chronological Indexes. Authors of Comments also are listed in the Author Index.

## Subject Index

### AIRCRAFT TECHNOLOGY, CONVENTIONAL, STOL/VTOL

#### *Aerodynamics*

- B07-039** Optimal Classification Criteria of Hypersonic Inlet Start/Unstart  
**B07-030** Method for Aerodynamic Analysis of Wind Turbines at Peak Power

#### *Flow Control*

- B07-098** Flow-Control-Enabled Aggressive Turbine Transition Ducts and Engine System Analysis  
**B07-123** Influence of Jet-Induced Transition on Separating Low-Pressure Turbine Boundary Layers

#### *Fuels and Fuel Systems*

- B07-162** Simulation of an Electrostatically Driven Microinjector  
**B07-075** Thickness of Liquid Film Formed by Impinging Jets on a Concave Wall  
**B07-080** Polymer-Grafted Metal Nanoparticles for Fuel Applications

#### *Manufacturing*

- B07-093** Friction Stir Welding of GRCop-84 for Combustion Chamber Liners

#### *Micro Air Vehicles*

- B07-024** Development of a Dynamometer for Measuring Small Internal-Combustion Engine Performance

#### *Noise*

- B07-046** Acoustic Simulation of Coaxial Hot Air Jets Using Cold Helium-Air Mixture Jets

#### *Powerplant Integration*

- B07-106** Noble-Gas Binary Mixtures for Closed-Brayton-Cycle Space Reactor Power Systems

#### *Rotorcraft*

- B07-077** Online Vibration Monitoring of Ball Bearing Damage Using an Experimental Test Rig

#### *Vibration*

- B07-077** Online Vibration Monitoring of Ball Bearing Damage Using an Experimental Test Rig

## ENERGY

#### *Alternate Fuels*

- B07-159** Ignition and Oxidation of Lean CO/H<sub>2</sub> Fuel Blends in Air  
**B07-141** Hydrogen from Steam Reforming of Coal-Derived Methanol  
**B07-022** Combustion Behaviors Resulting from Bimodal Aluminum Size Distributions in Thermites  
**B07-072** Autoignition Correlations for Pipeline Natural Gas at Low and Intermediate Temperatures

#### *Batteries*

- B07-107** Conceptual Design of Americium Nuclear Battery for Space Power Applications

#### *Fuel Cells*

- B07-054** Performance of Proton Exchange Membrane Fuel Cell at High-Altitude Conditions  
**B07-141** Hydrogen from Steam Reforming of Coal-Derived Methanol

#### *Fuel Economy*

- B07-108** Demonstration of Microcoil Heaters for Microthrusters

#### *Hydrogen and Unique Fuels*

- B07-141** Hydrogen from Steam Reforming of Coal-Derived Methanol  
**B07-159** Ignition and Oxidation of Lean CO/H<sub>2</sub> Fuel Blends in Air

#### *Nuclear Fission*

- B07-010** Magnetohydrodynamic Vortex Containment for Gas Core Nuclear Propulsion, Part 1: Concept Overview  
**B07-011** Magnetohydrodynamic Vortex Containment, Part 2: Equilibrium of Uranium Fluoride Fuel in Hydrogen Propellant  
**B07-051** Magnetohydrodynamic Vortex Containment, Part 4: System Performance Assessment  
**B07-107** Conceptual Design of Americium Nuclear Battery for Space Power Applications  
**B07-078** Model Fidelity Requirements for Closed-Brayton-Cycle Space Power Systems

#### *Rotating Machinery*

- B07-078** Model Fidelity Requirements for Closed-Brayton-Cycle Space Power Systems

#### *Wind Power*

- B07-030** Method for Aerodynamic Analysis of Wind Turbines at Peak Power

## FLUID DYNAMICS

#### *Aeroacoustics*

- B07-018** Acoustic Instability of the Slab Rocket Motor  
**B07-046** Acoustic Simulation of Coaxial Hot Air Jets Using Cold Helium-Air Mixture Jets  
**B07-120** Progress Toward Large-Eddy Simulations for Prediction of Realistic Nozzle Systems  
**B07-121** Three-Dimensional Nonreflecting Boundary Conditions for Swirling Flow in Turbomachinery  
**B07-023** Combined Numerical and Experimental Investigation of a Hobby-Scale Pulsejet  
**B07-014** Experimental and Theoretical Investigation of Base-Flow Buffeting on Ariane5 Launch Vehicles

#### *Boundary Layers and Heat Transfer-Laminar*

- B07-111** Axial Temperature Behavior of a Heat Exchanger Tube for Microwave Thermal Rockets

### **Boundary-Layer Stability and Transition**

**B07-036** Roughness and Secondary Flow Effects on Turbine Vane External Heat Transfer

### **Computational Fluid Dynamics**

**B07-116** Modeling Jet Engine Aerosols in the Postcombustor Flow Path and Sampling System

**B07-140** Thrust Termination Dynamics of Solid Propellant Rocket Motors

**B07-160** Impeller-Diffuser Interaction in Centrifugal Compressors: Numerical Analysis of Radiver Test Case

**B07-121** Three-Dimensional Nonreflecting Boundary Conditions for Swirling Flow in Turbomachinery

**B07-076** Jets in Crossflow Mixing Analysis Using Computational Fluid Dynamics and Mathematical Optimization

**B07-032** Quadrant Analysis of a Mixer-Ejector Nozzle for Supersonic Transport Applications

**B07-100** Aerodynamic Inverse Design for Viscous Flow in Turbomachinery Blading

### **Hydrodynamics**

**B07-149** Nonlinear Response of Plain-Orifice Injectors to Nonacoustic Pressure Oscillations

**B07-061** Modeling a Two-Stage High-Power Anode Layer Thruster and its Plume

### **Hypersonic Flow**

**B07-144** Hypersonic Inlet Studies for a Small Scale Rocket-Based Combined-Cycle Engine

**B07-147** Design and Characterization of a Hypervelocity Expansion Tube Facility

**B07-124** Internal Flowfield Investigation of a Hypersonic Inlet at Mach 6 with Bleed

### **Inlet, Nozzle, Diffuser, and Channel Flows**

**B07-124** Internal Flowfield Investigation of a Hypersonic Inlet at Mach 6 with Bleed

**B07-153** Effect of Chamber Pressure and Propellant Composition on Erosion Rate of Graphite Rocket Nozzle

**B07-096** Experimental Study of the Unstable-Unstarted Condition of a Hypersonic Inlet at Mach 6

**B07-144** Hypersonic Inlet Studies for a Small Scale Rocket-Based Combined-Cycle Engine

**B07-122** Characterization and Performance Enhancement of Submerged Inlet with Flush-Mounted Planar Side Entrance

**B07-031** Performance Analysis of an Infinite Array Linear Clustered Plug Nozzle

**B07-039** Optimal Classification Criteria of Hypersonic Inlet Start/Unstart

**B07-047** Experimental Study of Near-Field Flow Structure in Hollow Cone Pressure Swirl Sprays

**B07-032** Quadrant Analysis of a Mixer-Ejector Nozzle for Supersonic Transport Applications

**B07-025** Experimental Characterization of an Isothermal Swirler Flowfield

**B07-120** Progress Toward Large-Eddy Simulations for Prediction of Realistic Nozzle Systems

### **Jets, Wakes, and Viscid-Inviscid Flow Interactions**

**B07-120** Progress Toward Large-Eddy Simulations for Prediction of Realistic Nozzle Systems

**B07-043** Effect of Pulse Length and Ejector Radius on Unsteady Ejector Performance

**B07-045** Measurements in an Acoustically Driven Coaxial Jet Under Sub-, Near-, and Supercritical Conditions

**B07-015** Simulation of Flow and Mixing from a Cryogenic Rocket Injector

**B07-044** Vortex Structure Produced by a Laterally Inclined Supersonic Jet in Transonic Crossflow

**B07-095** Simulation of Transverse Gaseous Injection Through Diamond Ports into Supersonic Freestream

### **Multiphase Flows**

**B07-150** Experimental Investigation of Waterhammer in Simplified Feed Lines of Satellite Propulsion Systems

**B07-048** Investigation of Spray Behavior Downstream of an Aeroengine Injector with Acoustic Excitation

**B07-148** Effect of Recess on the Spray Characteristics of Liquid-Liquid Swirl Coaxial Injectors

### **Plasmadynamics and MHD**

**B07-051** Magnetohydrodynamic Vortex Containment, Part 4: System Performance Assessment

**B07-050** Magnetohydrodynamic Vortex Containment, Part 3: 1-D Axisymmetric Flow Model

**B07-010** Magnetohydrodynamic Vortex Containment for Gas Core Nuclear Propulsion, Part 1: Concept Overview

**B07-006** Modeling and Performance Analysis of the Pulsed Inductive Thruster

**B07-126** Numerical Study of an Electron-Beam-Confined Faraday Accelerator

**B07-105** Modeling of the Pulsed Inductive Thruster Operating with Ammonia Propellant

**B07-062** Effects of Equation of State and Transport on Pulsed Plasma Accelerator Modeling

**B07-008** Computational Study of Primary Electron Confinement by Magnetic Fields in the Discharge Chamber of an Ion Engine

### **Rarefied Flows**

**B07-155** Microscale Thrusters with Pulsed Optical Lattices/Gas Nonresonant Dipole Interaction

### **Reacting Flows and Combustion**

**B07-088** Combustion of Nanoscale Al/MoO<sub>3</sub> Thermite in Microchannels

**B07-117** Postcombustion Evolution of Soot Properties in an Aircraft Engine

**B07-087** Reaction Propagation of Four Nanoscale Energetic Composites (Al/MoO<sub>3</sub>, Al/WO<sub>3</sub>, Al/CuO, and Bi<sub>2</sub>O<sub>3</sub>)

**B07-019** Modeling of Propellants Containing Ultrafine Aluminum

**B07-022** Combustion Behaviors Resulting from Bimodal Aluminum Size Distributions in Thermites

**B07-094** Atomization and Flames in LOX/H<sub>2</sub>- and LOX/CH<sub>4</sub>-Spray Combustion

**B07-073** OH Planar Laser-Induced Fluorescence and Emission Imaging in High Pressure LOX/Methane Flames

**B07-052** Near-Blowoff Dynamics of a Bluff-Body Stabilized Flame

### **Separated Flows**

**B07-027** Variation of Vortex Structure in a Compressor Cascade at Different Incidences

**B07-123** Influence of Jet-Induced Transition on Separating Low-Pressure Turbine Boundary Layers

### **Shock Waves and Detonations**

**B07-037** Visualization of Wave Rotor Inner Flow Dynamics

**B07-012** Simple Numerical Modeling for Gasdynamic Design of Wave Rotors

**B07-041** Single-Cycle Unsteady Nozzle Phenomena in Pulse Detonation Engines

**B07-042** Detonation Transition Limit at an Abrupt Area Change Using a Reflecting Board

### **Subsonic Flow**

**B07-049** Transient Fluid Flow in Short-Pulse Operation of Bipropellant Thrusters

### **Supersonic Flow**

**B07-146** Flow Choking by Drag and Combustion in Supersonic Engine Testing

### **Transonic Flow**

**B07-029** PIV Study of Wake-Rotor Interactions in a Transonic Compressor at Various Operating Conditions

### **Unsteady Flows**

**B07-043** Effect of Pulse Length and Ejector Radius on Unsteady Ejector Performance

**B07-037** Visualization of Wave Rotor Inner Flow Dynamics

**B07-026** Finite Element Simulation of Blade Row Viscous Interactions: Vane Vibratory Stress Prediction

**B07-033** Computational Approach for Predicting Stall Inception in Multistage Axial Compressors

**B07-013** Parametric Investigation of Thrust Augmentation by Ejectors on a Pulsed Detonation Tube

**B07-023** Combined Numerical and Experimental Investigation of a Hobby-Scale Pulsejet

**B07-034** Investigation of Mistuning Effects on Cascade Flutter Using a Coupled Method

**B07-028** Turbulence Measurements and Analysis in a Multistage Axial Turbine

**B07-150** Experimental Investigation of Waterhammer in Simplified Feed Lines of Satellite Propulsion Systems

**B07-152** Effect of Hot-Streak Counts on Turbine Blade Heat Load and Forcing

**B07-160** Impeller-Diffuser Interaction in Centrifugal Compressors: Numerical Analysis of Radiver Test Case

### *Viscous Non-Boundary-Layer Flows*

**B07-055** Mean Flow Approximations for Solid Rocket Motors with Tapered Walls

### *Vortices*

**B07-050** Magnetohydrodynamic Vortex Containment, Part 3: 1-D Axisymmetric Flow Model

**B07-043** Effect of Pulse Length and Ejector Radius on Unsteady Ejector Performance

**B07-030** Method for Aerodynamic Analysis of Wind Turbines at Peak Power

**B07-036** Roughness and Secondary Flow Effects on Turbine Vane External Heat Transfer

**B07-044** Vortex Structure Produced by a Laterally Inclined Supersonic Jet in Transonic Crossflow

**B07-013** Parametric Investigation of Thrust Augmentation by Ejectors on a Pulsed Detonation Tube

## **GUIDANCE, CONTROL, AND DYNAMICS TECHNOLOGY**

### *Artificial Intelligence*

**B07-039** Optimal Classification Criteria of Hypersonic Inlet Start/Unstart

### *Engine Control*

**B07-099** Rate-Based Model Predictive Control of Turbofan Engine Clearance

### *Launch Vehicle Dynamics*

**B07-014** Experimental and Theoretical Investigation of Base-Flow Buffeting on Ariane5 Launch Vehicles

## **INTERDISCIPLINARY TOPICS**

### *Analytical and Numerical Methods*

**B07-126** Numerical Study of an Electron-Beam-Confined Faraday Accelerator

**B07-085** Molecular Dynamics Characterization of the Response of Ni/Al Nanolaminates Under Dynamic Loading

### *Atmospheric and Space Sciences*

**B07-112** Overview on the Aircraft Particle Emissions Experiment (APEX)

**B07-118** Quantification of Aircraft Engine Hydrocarbon Emissions Using Proton Transfer Reaction Mass Spectrometry

### *Environmental Effects*

**B07-114** Chemical Speciation of Hydrocarbon Emissions from a Commercial Aircraft Engine

**B07-113** Nitrogen Oxide (NO/NO<sub>2</sub>/HONO) Emissions Measurements in Aircraft Exhausts

### *Multidisciplinary Design Optimization*

**B07-076** Jets in Crossflow Mixing Analysis Using Computational Fluid Dynamics and Mathematical Optimization

**B07-098** Flow-Control-Enabled Aggressive Turbine Transition Ducts and Engine System Analysis

### *Research Facilities and Instrumentation*

**B07-028** Turbulence Measurements and Analysis in a Multistage Axial Turbine

## **LAUNCH VEHICLE AND MISSILE (LV/M) TECHNOLOGY**

### *Aerodynamics*

**B07-014** Experimental and Theoretical Investigation of Base-Flow Buffeting on Ariane5 Launch Vehicles

### *Configuration Design*

**B07-138** Airframe-Configuration Effect on Condition of Airflow to Engine in Hypersonic Flow

### *Launch Vehicle and Sounding Rocket Systems*

**B07-038** Conceptual Study of a Rocket-Ramjet Combined-Cycle Engine for an Aerospace Plane

### *Missile Systems*

**B07-153** Effect of Chamber Pressure and Propellant Composition on Erosion Rate of Graphite Rocket Nozzle

### *Propulsion and Propellant Systems*

**B07-133** System Modeling of Explosively Actuated Valves

**B07-148** Effect of Recess on the Spray Characteristics of Liquid-Liquid Swirl Coaxial Injectors

**B07-021** Regression Rates Study of Mixed Hybrid Propellants

**B07-111** Axial Temperature Behavior of a Heat Exchanger Tube for Microwave Thermal Rockets

**B07-080** Polymer-Grafted Metal Nanoparticles for Fuel Applications

**B07-122** Characterization and Performance Enhancement of Submerged Inlet with Flush-Mounted Planar Side Entrance

**B07-150** Experimental Investigation of Waterhammer in Simplified Feed Lines of Satellite Propulsion Systems

### *Simulation*

**B07-071** Solid Rocket Motor Internal Ballistics Simulation Using Three-Dimensional Grain Burnback

### *Testing, Flight and Ground*

**B07-069** Test Gas Vitiating Effects in a Dual-Mode Scramjet Combustor

### *Vibration*

**B07-017** Interaction Between Solid Rocket Motor Internal Flow and Structure During Flight

## **PROPULSION**

### *Advanced Space Propulsion*

**B07-004** Performance Characteristics of a Cluster of 5-kW Laboratory Hall Thrusters

**B07-059** Direct Experimental Evidence of Electromagnetic Inertia Manipulation Thrusting

**B07-008** Computational Study of Primary Electron Confinement by Magnetic Fields in the Discharge Chamber of an Ion Engine

**B07-031** Performance Analysis of an Infinite Array Linear Clustered Plug Nozzle

**B07-003** Microwave Electrothermal Thruster Performance

**B07-158** Electromagnetic Pumps for Liquid Metal-Fed Electric Thrusters

**B07-103** Effects of Cathode Configuration on Hall Thruster Cluster Plume Properties

**B07-102** Characterization of an Ion Thruster Neutralizer

**B07-111** Axial Temperature Behavior of a Heat Exchanger Tube for Microwave Thermal Rockets

**B07-101** Performance and Active Thermal Control of a 2-kW Hall Thruster with Segmented Electrodes

**B07-005** Performance and Flatness of a Multiple-Cathode, Rectangular Ion Thruster Discharge Chamber

**B07-128** Voltage-Modulated Flow Rate for Precise Thrust Control in Colloid Electrospray Propulsion

### *Airbreathing Propulsion*

**B07-127** Homogeneous-Dilution Model of Partially Fueled Simplified Pulse Detonation Engines

**B07-146** Flow Choking by Drag and Combustion in Supersonic Engine Testing

**B07-092** Effect of Supercritical Fuel Injection on Cycle Performance of Pulsed Detonation Engine

**B07-143** Experimental Study of a Combined-Cycle Engine Combustor in Ejector-Jet Mode

**B07-026** Finite Element Simulation of Blade Row Viscous Interactions: Vane Vibratory Stress Prediction

**B07-024** Development of a Dynamometer for Measuring Small Internal-Combustion Engine Performance

**B07-113** Nitrogen Oxide (NO/NO<sub>2</sub>/HONO) Emissions Measurements in Aircraft Exhausts

**B07-080** Polymer-Grafted Metal Nanoparticles for Fuel Applications

**B07-126** Numerical Study of an Electron-Beam-Confined Faraday Accelerator

**B07-070** Experimental Investigations of the Performance and Unsteady Behavior of a Supersonic Intake

**B07-074** Effect of Ambient Gas Density on Spray Characteristics of Swirling Liquid Sheets

**B07-122** Characterization and Performance Enhancement of Submerged Inlet with Flush-Mounted Planar Side Entrance

**B07-095** Simulation of Transverse Gaseous Injection Through Diamond Ports into Supersonic Freestream

**B07-162** Simulation of an Electrostatically Driven Microinjector

### *Combined-Cycle Engines*

**B07-038** Conceptual Study of a Rocket-Ramjet Combined-Cycle Engine for an Aerospace Plane

**B07-143** Experimental Study of a Combined-Cycle Engine Combustor in Ejector-Jet Mode

**B07-125** Mach-8 Tests of a Combined-Cycle Engine Combustor



### **Combustion and Combustor Designs**

- B07-136** Passive Control of Forced Combustion Instability in a Swirl-Stabilized Spray Combustor  
**B07-053** Laminar Flame Speeds of Preheated *iso*-Octane/O<sub>2</sub>/N<sub>2</sub> and *n*-Heptane/O<sub>2</sub>/N<sub>2</sub> Mixtures  
**B07-073** OH Planar Laser-Induced Fluorescence and Emission Imaging in High Pressure LOX/Methane Flames  
**B07-016** Combustion Stability Boundaries of the Subscale Rocket Chamber with Impinging Jet Injectors  
**B07-025** Experimental Characterization of an Isothermal Swirler Flowfield  
**B07-090** Computer Model of Aluminum Agglomeration on Burning Surface of Composite Solid Propellant  
**B07-091** Development of Scalable Space-Time Averaged Regression Rate Expressions for Hybrid Rockets  
**B07-139** Burning-Rate Calculations of Wide-Distribution Ammonium Perchlorate Composite Propellants  
**B07-154** Effect of Aluminum on Heat Flux from a Simulated Rocket Propellant Flame  
**B07-020** Laser-Driven Decomposition and Combustion of BTTN/GAP

### **Combustion Instability**

- B07-017** Interaction Between Solid Rocket Motor Internal Flow and Structure During Flight  
**B07-135** Combustion Instability with a Single-Element Swirl Injector  
**B07-018** Acoustic Instability of the Slab Rocket Motor  
**B07-055** Mean Flow Approximations for Solid Rocket Motors with Tapered Walls  
**B07-048** Investigation of Spray Behavior Downstream of an Aeroengine Injector with Acoustic Excitation  
**B07-016** Combustion Stability Boundaries of the Subscale Rocket Chamber with Impinging Jet Injectors  
**B07-045** Measurements in an Acoustically Driven Coaxial Jet Under Sub-, Near-, and Supercritical Conditions  
**B07-052** Near-Blowoff Dynamics of a Bluff-Body Stabilized Flame  
**B07-136** Passive Control of Forced Combustion Instability in a Swirl-Stabilized Spray Combustor  
**B07-149** Nonlinear Response of Plain-Orifice Injectors to Nonacoustic Pressure Oscillations

### **Detonation**

- B07-084** Multimillion Atom Reactive Simulations of Nanostructured Energetic Materials  
**B07-092** Effect of Supercritical Fuel Injection on Cycle Performance of Pulsed Detonation Engine  
**B07-127** Homogeneous-Dilution Model of Partially Fueled Simplified Pulse Detonation Engines  
**B07-009** Laser Propulsion for Ground Launch  
**B07-042** Detonation Transition Limit at an Abrupt Area Change Using a Reflecting Board  
**B07-041** Single-Cycle Unsteady Nozzle Phenomena in Pulse Detonation Engines  
**B07-013** Parametric Investigation of Thrust Augmentation by Ejectors on a Pulsed Detonation Tube

### **Droplet and Spray Characterization**

- B07-047** Experimental Study of Near-Field Flow Structure in Hollow Cone Pressure Swirl Sprays  
**B07-134** Experimental Investigation of a Pressure Swirl Atomizer Spray  
**B07-074** Effect of Ambient Gas Density on Spray Characteristics of Swirling Liquid Sheets  
**B07-075** Thickness of Liquid Film Formed by Impinging Jets on a Concave Wall  
**B07-045** Measurements in an Acoustically Driven Coaxial Jet Under Sub-, Near-, and Supercritical Conditions

### **Electric Propulsion**

- B07-009** Laser Propulsion for Ground Launch  
**B07-061** Modeling a Two-Stage High-Power Anode Layer Thruster and its Plume  
**B07-005** Performance and Flatness of a Multiple-Cathode, Rectangular Ion Thruster Discharge Chamber  
**B07-007** Whole Ion Optics Gridlet Simulations Using a Hybrid-Grid Immersed-Finite-Element Particle-in-Cell Code  
**B07-003** Microwave Electrothermal Thruster Performance  
**B07-064** Thermal Model of the Hollow Cathode Using Numerically Simulated Plasma Fluxes  
**B07-063** Ground Chamber Measurements of the Electromagnetic Emissions from the Hayabusa Ion Engine  
**B07-068** LaB<sub>6</sub> Hollow Cathodes for Ion and Hall Thrusters  
**B07-102** Characterization of an Ion Thruster Neutralizer  
**B07-060** Sub-Milli-Newton Class Miniature Microwave Ion Thruster  
**B07-103** Effects of Cathode Configuration on Hall Thruster Cluster Plume Properties  
**B07-104** Alternate Direct-Drive Option for Electric Propulsion  
**B07-130** Analytical Ion Thruster Discharge Performance Model  
**B07-101** Performance and Active Thermal Control of a 2-kW Hall Thruster with Segmented Electrodes  
**B07-066** Numerical Analysis of Hall Thruster Firing Tests  
**B07-105** Modeling of the Pulsed Inductive Thruster Operating with Ammonia Propellant  
**B07-006** Modeling and Performance Analysis of the Pulsed Inductive Thruster  
**B07-067** Powered Flight of Electron Cyclotron Resonance Ion Engines on Hayabusa Explorer  
**B07-065** Hall Thruster Cluster Operation with a Shared Cathode  
**B07-129** Emissive Membrane Ion Thruster Concept  
**B07-157** Measurements of Current Distribution on a Two-Grid-Ion-Extraction-System Gridlet  
**B07-158** Electromagnetic Pumps for Liquid Metal-Fed Electric Thrusters  
**B07-002** Energetics of Propellant Options for High-Power Hall Thrusters  
**B07-062** Effects of Equation of State and Transport on Pulsed Plasma Accelerator Modeling  
**B07-008** Computational Study of Primary Electron Confinement by Magnetic Fields in the Discharge Chamber of an Ion Engine

- B07-059** Direct Experimental Evidence of Electromagnetic Inertia Manipulation Thrusting  
**B07-004** Performance Characteristics of a Cluster of 5-kW Laboratory Hall Thrusters  
**B07-128** Voltage-Modulated Flow Rate for Precise Thrust Control in Colloid Electrospray Propulsion  
**B07-131** Experimental Characterization of a Micro-Hall Thruster  
**B07-156** Erosion Processes of the Discharge Cathode Assembly of Ring-Cusp Gridded Ion Thrusters  
**B07-110** Performance of a Low-Power Cylindrical Hall Thruster

### **Emissions and Noises**

- B07-117** Postcombustion Evolution of Soot Properties in an Aircraft Engine  
**B07-136** Passive Control of Forced Combustion Instability in a Swirl-Stabilized Spray Combustor  
**B07-115** Physical Characterization of Aerosol Emissions from a Commercial Gas Turbine Engine  
**B07-116** Modeling Jet Engine Aerosols in the Postcombustor Flow Path and Sampling System  
**B07-109** Effects of Pressure on Performance of Mesoscale Burner Arrays for Gas-Turbine Applications  
**B07-119** Evolution of Carbonaceous Aerosol and Aerosol Precursor Emissions Through a Jet Engine  
**B07-112** Overview on the Aircraft Particle Emissions Experiment (APEX)  
**B07-114** Chemical Speciation of Hydrocarbon Emissions from a Commercial Aircraft Engine  
**B07-118** Quantification of Aircraft Engine Hydrocarbon Emissions Using Proton Transfer Reaction Mass Spectrometry  
**B07-046** Acoustic Simulation of Coaxial Hot Air Jets Using Cold Helium-Air Mixture Jets

### **Engine Control Integration and Health Monitoring**

- B07-099** Rate-Based Model Predictive Control of Turbofan Engine Clearance

### **Engine Cooling and Heat Transfer**

- B07-152** Effect of Hot-Streak Counts on Turbine Blade Heat Load and Forcing

### **Engine Materials**

- B07-093** Friction Stir Welding of GRCop-84 for Combustion Chamber Liners

### **Engine Performance**

- B07-023** Combined Numerical and Experimental Investigation of a Hobby-Scale Pulsejet  
**B07-097** Vitiation Effects on Scramjet Engine Performance in Mach 6 Flight Conditions  
**B07-035** Analytical Approach for Investigating Bristle/Backplate Hysteresis Phenomenon in Brush Seals  
**B07-024** Development of a Dynamometer for Measuring Small Internal-Combustion Engine Performance  
**B07-032** Quadrant Analysis of a Mixer-Ejector Nozzle for Supersonic Transport Applications

**B07-127** Homogeneous-Dilution Model of Partially Fueled Simplified Pulse Detonation Engines

### ***Fuels and Propellants, Properties of***

**B07-082** Characterization of Nanometer- to Micron-Sized Aluminum Powders: Size Distribution from Thermogravimetric Analysis

**B07-021** Regression Rates Study of Mixed Hybrid Propellants

**B07-053** Laminar Flame Speeds of Preheated *iso*-Octane/O<sub>2</sub>/N<sub>2</sub> and *n*-Heptane/O<sub>2</sub>/N<sub>2</sub> Mixtures

**B07-011** Magnetohydrodynamic Vortex Containment, Part 2: Equilibrium of Uranium Fluoride Fuel in Hydrogen Propellant

**B07-040** Combustion and Ignition of Thermally Cracked Kerosene in Supersonic Model Combustors

**B07-081** Hazard Characterization of Uncoated and Coated Aluminium Nanopowder Compositions

**B07-137** Experiments and Simulations of the Freezing of Jet Fuel in Forced Flow

**B07-094** Atomization and Flames in LOX/H<sub>2</sub>- and LOX/CH<sub>4</sub>-Spray Combustion

**B07-142** Hydrogen Peroxide Gas Generator with Dual Catalytic Beds for Nonpreheating Startup

**B07-090** Computer Model of Aluminum Agglomeration on Burning Surface of Composite Solid Propellant

**B07-049** Transient Fluid Flow in Short-Pulse Operation of Bipropellant Thrusters

**B07-154** Effect of Aluminum on Heat Flux from a Simulated Rocket Propellant Flame

**B07-089** Energetic Nanocomposite Lead-Free Electric Primers

**B07-139** Burning-Rate Calculations of Wide-Distribution Ammonium Perchlorate Composite Propellants

**B07-020** Laser-Driven Decomposition and Combustion of BTTN/GAP

**B07-022** Combustion Behaviors Resulting from Bimodal Aluminum Size Distributions in Thermites

**B07-002** Energetics of Propellant Options for High-Power Hall Thrusters

### ***Gas Turbine Engines***

**B07-109** Effects of Pressure on Performance of Mesoscale Burner Arrays for Gas-Turbine Applications

**B07-035** Analytical Approach for Investigating Bristle/Backplate Hysteresis Phenomenon in Brush Seals

**B07-112** Overview on the Aircraft Particle Emissions Experiment (APEX)

**B07-114** Chemical Speciation of Hydrocarbon Emissions from a Commercial Aircraft Engine

**B07-072** Autoignition Correlations for Pipeline Natural Gas at Low and Intermediate Temperatures

**B07-033** Computational Approach for Predicting Stall Inception in Multistage Axial Compressors

**B07-048** Investigation of Spray Behavior Downstream of an Aeroengine Injector with Acoustic Excitation

**B07-029** PIV Study of Wake-Rotor Interactions in a Transonic Compressor at Various Operating Conditions

**B07-123** Influence of Jet-Induced Transition on Separating Low-Pressure Turbine Boundary Layers

**B07-100** Aerodynamic Inverse Design for Viscous Flow in Turbomachinery Blading

**B07-117** Postcombustion Evolution of Soot Properties in an Aircraft Engine

**B07-159** Ignition and Oxidation of Lean CO/H<sub>2</sub> Fuel Blends in Air

### ***Hybrid Rocket Engines***

**B07-021** Regression Rates Study of Mixed Hybrid Propellants

**B07-091** Development of Scalable Space-Time Averaged Regression Rate Expressions for Hybrid Rockets

**B07-058** Investigation of Metallized and Non-metallized Hydroxyl Terminated Polybutadiene/Hydrogen Peroxide Hybrid Rockets

### ***Hypersonic Propulsion***

**B07-001** Scramjets and Surfboards: Some Forgotten History

**B07-031** Performance Analysis of an Infinite Array Linear Clustered Plug Nozzle

**B07-097** Vitiation Effects on Scramjet Engine Performance in Mach 6 Flight Conditions

**B07-144** Hypersonic Inlet Studies for a Small Scale Rocket-Based Combined-Cycle Engine

**B07-147** Design and Characterization of a Hypervelocity Expansion Tube Facility

**B07-070** Experimental Investigations of the Performance and Unsteady Behavior of a Supersonic Intake

**B07-040** Combustion and Ignition of Thermally Cracked Kerosene in Supersonic Model Combustors

**B07-096** Experimental Study of the Unstable-Unstarted Condition of a Hypersonic Inlet at Mach 6

**B07-124** Internal Flowfield Investigation of a Hypersonic Inlet at Mach 6 with Bleed

**B07-138** Airframe-Configuration Effect on Condition of Airflow to Engine in Hypersonic Flow

### ***Ignition***

**B07-084** Multimillion Atom Reactive Simulations of Nanostructured Energetic Materials

**B07-086** Processing and Ignition Characteristics of Aluminum-Bismuth Trioxide Nanothermite System

**B07-092** Effect of Supercritical Fuel Injection on Cycle Performance of Pulsed Detonation Engine

**B07-072** Autoignition Correlations for Pipeline Natural Gas at Low and Intermediate Temperatures

**B07-145** Flowfield Studies of Diamond-Shaped Fuel Injector in a Supersonic Flow

### ***Liquid Rocket Engines***

**B07-151** Analysis of Thermal Effects in Cavitating Liquid Hydrogen Inducers

**B07-074** Effect of Ambient Gas Density on Spray Characteristics of Swirling Liquid Sheets

**B07-049** Transient Fluid Flow in Short-Pulse Operation of Bipropellant Thrusters

**B07-015** Simulation of Flow and Mixing from a Cryogenic Rocket Injector

**B07-093** Friction Stir Welding of GRCop-84 for Combustion Chamber Liners

**B07-075** Thickness of Liquid Film Formed by Impinging Jets on a Concave Wall

**B07-135** Combustion Instability with a Single-Element Swirl Injector

**B07-142** Hydrogen Peroxide Gas Generator with Dual Catalytic Beds for Nonpreheating Startup

**B07-094** Atomization and Flames in LOX/H<sub>2</sub>- and LOX/CH<sub>4</sub>-Spray Combustion

**B07-016** Combustion Stability Boundaries of the Subscale Rocket Chamber with Impinging Jet Injectors

**B07-073** OH Planar Laser-Induced Fluorescence and Emission Imaging in High Pressure LOX/Methane Flames

**B07-149** Nonlinear Response of Plain-Orifice Injectors to Nonacoustic Pressure Oscillations

**B07-148** Effect of Recess on the Spray Characteristics of Liquid-Liquid Swirl Coaxial Injectors

**B07-143** Experimental Study of a Combined-Cycle Engine Combustor in Ejector-Jet Mode

### ***Micro Propulsion and Power***

**B07-155** Microscale Thrusters with Pulsed Optical Lattices/Gas Nonresonant Dipole Interaction

**B07-161** Development and Ground Tests of a 100-Millinewton Hydrogen Peroxide Monopropellant Microthruster

**B07-128** Voltage-Modulated Flow Rate for Precise Thrust Control in Colloid Electrospray Propulsion

**B07-131** Experimental Characterization of a Micro-Hall Thruster

**B07-108** Demonstration of Microcoil Heaters for Microthrusters

**B07-012** Simple Numerical Modeling for Gasdynamic Design of Wave Rotors

**B07-060** Sub-Milli-Newton Class Miniature Microwave Ion Thruster

**B07-059** Direct Experimental Evidence of Electromagnetic Inertia Manipulation Thrusting

**B07-109** Effects of Pressure on Performance of Mesoscale Burner Arrays for Gas-Turbine Applications

**B07-162** Simulation of an Electrostatically Driven Microinjector

### ***Microwaves***

**B07-067** Powered Flight of Electron Cyclotron Resonance Ion Engines on Hayabusa Explorer

**B07-003** Microwave Electrothermal Thruster Performance

### ***Nuclear Propulsion and Power***

**B07-051** Magnetohydrodynamic Vortex Containment, Part 4: System Performance Assessment

**B07-011** Magnetohydrodynamic Vortex Containment, Part 2: Equilibrium of Uranium Fluoride Fuel in Hydrogen Propellant

**B07-050** Magnetohydrodynamic Vortex Containment, Part 3: 1-D Axisymmetric Flow Model

**B07-010** Magnetohydrodynamic Vortex Containment for Gas Core Nuclear Propulsion, Part 1: Concept Overview

**B07-107** Conceptual Design of Americium Nuclear Battery for Space Power Applications

- B07-106** Noble-Gas Binary Mixtures for Closed-Brayton-Cycle Space Reactor Power Systems  
**B07-004** Performance Characteristics of a Cluster of 5-kW Laboratory Hall Thrusters

### *Power Conditioning and Storage*

- B07-104** Alternate Direct-Drive Option for Electric Propulsion

### *Ramjets and Scramjets*

- B07-052** Near-Blowoff Dynamics of a Bluff-Body Stabilized Flame  
**B07-038** Conceptual Study of a Rocket-Ramjet Combined-Cycle Engine for an Aerospace Plane  
**B07-097** Vitiation Effects on Scramjet Engine Performance in Mach 6 Flight Conditions  
**B07-001** Scramjets and Surfboards: Some Forgotten History  
**B07-070** Experimental Investigations of the Performance and Unsteady Behavior of a Supersonic Intake  
**B07-069** Test Gas Vitiation Effects in a Dual-Mode Scramjet Combustor  
**B07-145** Flowfield Studies of Diamond-Shaped Fuel Injector in a Supersonic Flow  
**B07-138** Airframe-Configuration Effect on Condition of Airflow to Engine in Hypersonic Flow  
**B07-096** Experimental Study of the Unstable-Unstarted Condition of a Hypersonic Inlet at Mach 6

### *Rotating Machinery*

- B07-077** Online Vibration Monitoring of Ball Bearing Damage Using an Experimental Test Rig  
**B07-012** Simple Numerical Modeling for Gas-dynamic Design of Wave Rotors  
**B07-037** Visualization of Wave Rotor Inner Flow Dynamics

### *Solid Rocket Motors*

- B07-018** Acoustic Instability of the Slab Rocket Motor  
**B07-055** Mean Flow Approximations for Solid Rocket Motors with Tapered Walls  
**B07-057** Solid Propellant Grain Design and Burnback Simulation Using a Minimum Distance Function  
**B07-071** Solid Rocket Motor Internal Ballistics Simulation Using Three-Dimensional Grain Burnback  
**B07-090** Computer Model of Aluminum Agglomeration on Burning Surface of Composite Solid Propellant  
**B07-139** Burning-Rate Calculations of Wide-Distribution Ammonium Perchlorate Composite Propellants  
**B07-140** Thrust Termination Dynamics of Solid Propellant Rocket Motors  
**B07-019** Modeling of Propellants Containing Ultrafine Aluminum  
**B07-017** Interaction Between Solid Rocket Motor Internal Flow and Structure During Flight  
**B07-056** Decomposition of Aluminum Hydride Under Solid Rocket Motor Conditions  
**B07-163** Microstructure of Composite Propellants Using Simulated Packings and X-Ray Tomography

### *Supersonic Combustion*

- B07-088** Combustion of Nanoscale Al/MoO<sub>3</sub> Thermite in Microchannels  
**B07-087** Reaction Propagation of Four Nanoscale Energetic Composites (Al/MoO<sub>3</sub>, Al/WO<sub>3</sub>, Al/CuO, and Bi<sub>2</sub>O<sub>3</sub>)  
**B07-001** Scramjets and Surfboards: Some Forgotten History  
**B07-095** Simulation of Transverse Gaseous Injection Through Diamond Ports into Supersonic Freestream  
**B07-145** Flowfield Studies of Diamond-Shaped Fuel Injector in a Supersonic Flow  
**B07-069** Test Gas Vitiation Effects in a Dual-Mode Scramjet Combustor  
**B07-040** Combustion and Ignition of Thermally Cracked Kerosene in Supersonic Model Combustors

### *Transient Combustion*

- B07-140** Thrust Termination Dynamics of Solid Propellant Rocket Motors  
**B07-020** Laser-Driven Decomposition and Combustion of BTTN/GAP  
**B07-133** System Modeling of Explosively Actuated Valves

### *Turbomachinery*

- B07-100** Aerodynamic Inverse Design for Viscous Flow in Turbomachinery Blading  
**B07-028** Turbulence Measurements and Analysis in a Multistage Axial Turbine  
**B07-034** Investigation of Mistuning Effects on Cascade Flutter Using a Coupled Method  
**B07-160** Impeller-Diffuser Interaction in Centrifugal Compressors: Numerical Analysis of Radiver Test Case  
**B07-152** Effect of Hot-Streak Counts on Turbine Blade Heat Load and Forcing  
**B07-035** Analytical Approach for Investigating Bristle/Backplate Hysteresis Phenomenon in Brush Seals  
**B07-151** Analysis of Thermal Effects in Cavitating Liquid Hydrogen Inducers  
**B07-033** Computational Approach for Predicting Stall Inception in Multistage Axial Compressors  
**B07-098** Flow-Control-Enabled Aggressive Turbine Transition Ducts and Engine System Analysis  
**B07-029** PIV Study of Wake-Rotor Interactions in a Transonic Compressor at Various Operating Conditions  
**B07-026** Finite Element Simulation of Blade Row Viscous Interactions: Vane Vibratory Stress Prediction  
**B07-027** Variation of Vortex Structure in a Compressor Cascade at Different Incidences

## SPACE TECHNOLOGY

### *Mission Design and Analysis*

- B07-104** Alternate Direct-Drive Option for Electric Propulsion

### *Space Systems*

- B07-133** System Modeling of Explosively Actuated Valves

### *Spacecraft Power*

- B07-078** Model Fidelity Requirements for Closed-Brayton-Cycle Space Power Systems  
**B07-132** Realistic Specific Power Expectations for Advanced Radioisotope Power Systems

### *Spacecraft Propulsion System Integration*

- B07-065** Hall Thruster Cluster Operation with a Shared Cathode  
**B07-067** Powered Flight of Electron Cyclotron Resonance Ion Engines on Hayabusa Explorer  
**B07-063** Ground Chamber Measurements of the Electromagnetic Emissions from the Hayabusa Ion Engine

## STRUCTURAL MECHANICS AND MATERIALS

### *Aeroelasticity and Control*

- B07-034** Investigation of Mistuning Effects on Cascade Flutter Using a Coupled Method

### *Materials Structural Properties*

- B07-085** Molecular Dynamics Characterization of the Response of Ni/Al Nanolaminates Under Dynamic Loading

## THERMOPHYSICS AND HEAT TRANSFER

### *Ablation, Pyrolysis, Thermal Decomposition and Degradation*

- B07-081** Hazard Characterization of Uncoated and Coated Aluminium Nanopowder Compositions  
**B07-108** Demonstration of Microcoil Heaters for Microthrusters

### *Aerothermodynamics/Thermal Protection*

- B07-036** Roughness and Secondary Flow Effects on Turbine Vane External Heat Transfer

### *Computational Heat Transfer*

- B07-137** Experiments and Simulations of the Freezing of Jet Fuel in Forced Flow

### *Cryogenics*

- B07-015** Simulation of Flow and Mixing from a Cryogenic Rocket Injector  
**B07-151** Analysis of Thermal Effects in Cavitating Liquid Hydrogen Inducers

### *Laser Interaction*

- B07-155** Microscale Thrusters with Pulsed Optical Lattices/Gas Nonresonant Dipole Interaction

### *Melting/Solidification*

- B07-137** Experiments and Simulations of the Freezing of Jet Fuel in Forced Flow  
**B07-085** Molecular Dynamics Characterization of the Response of Ni/Al Nanolaminates Under Dynamic Loading

### ***Nonintrusive Diagnostics***

**B07-134** Experimental Investigation of a Pressure Swirl Atomizer Spray

### ***Thermal Modeling and Analysis***

**B07-154** Effect of Aluminum on Heat Flux from a Simulated Rocket Propellant Flame

### ***Thermochemistry and Chemical Kinetics***

**B07-084** Multimillion Atom Reactive Simulations of Nanostructured Energetic Materials

**B07-053** Laminar Flame Speeds of Preheated *iso*-Octane/O<sub>2</sub>/N<sub>2</sub> and *n*-Heptane/O<sub>2</sub>/N<sub>2</sub> Mixtures

**B07-079** Manufacturing and Performance of Nanometric Al/MoO<sub>3</sub> Energetic Materials

**B07-083** Kinetic Analysis of Thermite Reactions in Al-MoO<sub>3</sub> Nanocomposites

**B07-086** Processing and Ignition Characteristics of Aluminum-Bismuth Trioxide Nanothermite System

**B07-082** Characterization of Nanometer- to Micron-Sized Aluminum Powders: Size Distribution from Thermogravimetric Analysis

**B07-153** Effect of Chamber Pressure and Propellant Composition on Erosion Rate of Graphite Rocket Nozzle

### ***Thermophysical Properties***

**B07-081** Hazard Characterization of Uncoated and Coated Aluminium Nanopowder Compositions

**B07-106** Noble-Gas Binary Mixtures for Closed-Brayton-Cycle Space Reactor Power Systems