

TSAGI SCIENCE JOURNAL

CONTENTS, VOLUME 46, 2015

Page Range of Issues; Issue 1: 1-85; Issue 2: 87-192; Issue 3: 193-305; Issue 4: 307-409; Issue 5: 411-507; Issue 6: 509-618; Issue 7: 619-714; Issue 8: 715-841

Issues 1

Discontinuous Galerkin Method for the Reynolds Equation System with the EARSM	1
<i>I.S. Bosnyakov, V.V. Vlasenko, A.V. Volkov, S.V. Lyapunov, & A.I. Troshin</i>	
Calculation of Aerodynamic Characteristics of Helicopter Rotor in Hover and Airfoils in Nonstationary Flow	17
<i>N.A. Vladimirova</i>	
Global Cross-Correlation of the Wall Pressure Fluctuations in Front of the “Forward-Facing Step/Backward-Facing Step” Combination and in its Wake	29
<i>A.Yu. Golubev & B.M. Efimtsov</i>	
Punching of Pressurized Compartment Shell of a Spacecraft by High-Speed Particles with Generation of Acoustic Waves	43
<i>S.P. Avershyev, Yu.M. Lipnitskii, G.A. Makarevich, N. Mamadaliev, L.F. Pelipenko, A.L. Polovnev, A.S. Skalkin, P.V. Tretyakov, & A.G. Shokolov</i>	
Experimental Measuring of the Infrared Directional Emissivity of Materials	55
<i>A.B. Kornilov</i>	
Selection Method of Monitoring Algorithm Thresholds for Airliner's Digital Fly-by-Wire Control System	63
<i>S.G. Bazhenov & N.B. Lysenkova</i>	
Reduction of Short-Wave Instability of the System of Moment Equations by Means of System Expansion	75
<i>Yu.A. Nikitchenko</i>	

Issue 2

Numerical Investigation of a Steady Viscous Incompressible Fluid Flow over a Family of Elliptic Cylinders	87
<i>G.L. Korolev</i>	
Axisymmetric Body at an Angle of Attack in Hypersonic Flow: Heat Problem	107
<i>V.A. Bashkin, I.V. Egorov, & I.V. Ezhev</i>	
Characteristics Investigation of 2D and 3D Intakes of Supersonic Passenger Aircraft	123
<i>V.A. Vinogradov, V.A. Stepanov, & Ya.A. Melnikov</i>	

Parametric Experimental Investigations on the Cross Correlation of the Pressure Fluctuations Generated by a Cascade of “Forward-Facing Step/Backward-Facing Step” Combinations	143
<i>A.Yu. Golubev & B.M. Efimtsov</i>	
Measurements of Deformation of the Passenger Plane Wing in Flight by the Videogrammetry Method	161
<i>V.P. Kulesh</i>	
Method of Determination of Rational Design Parameters using the Finite-Element Method	175
<i>E.V. Kasumov</i>	

Issue 3

Self-Similar and Limiting Solutions of Turbulent Boundary Layer Equations: Conditions of D'alembert's Paradox	193
<i>V.V. Mikhailov & N.V. Samoilova</i>	
Evolution of Vorticity in Swirling Axisymmetric Flows of a Viscous Incompressible Fluid	209
<i>G.B. Sizykh</i>	
Dynamics of a Vortex Spiral	219
<i>V.F. Molchanov</i>	
Nonuniqueness of the Solution in the Vicinity of the Plane of Symmetry of a Delta Wing in a Hypersonic Flow with Strong Interaction	231
<i>G.N. Dudin & P.H. Nguyen</i>	
Active Cancellation of the Crossflow in a Subsonic Boundary Layer on an Oblique Wing	247
<i>S.V. Manuilovich</i>	

Design of Fly-by-Wire Control System Algorithms for Advanced High-Speed Helicopter	259
<i>V.A. Anikin, O.V. Animitsa, V.M. Kuvshinov, & V.A. Leontiev</i>	
Some Aspects of Modeling a High-Aspect-Ratio Composite Wing-Box by an Anisotropic Beam	289
<i>S.A. Tuktarov & V.V. Chedrik</i>	

Issue 4

Congratulations to Sergei Leonidovich Chernyshev on his 60th Birthday!	307
<i>TsAGI Editorial Board</i>	
Modeling of the Laminar-Turbulent Transition on a Swept and Straight Wings with the use of Numerical Solutions of the Navier–Stokes Equations	309
<i>V.V. Vozhdaev, A.F. Kiselev, D.S. Shboev, L.L. Teperin, & S.L. Chernyshev</i>	
Influence of Small Spatial Perturbations of a Supersonic Flow on Pressure and Heat Flux towards a Cylinder Surface	323
<i>I.V. Egorov & V.V. Shvedchenko</i>	

Special Solutions for Supersonic Flow of an Ideal Gas around the V-shaped Wing with Flow Separations	345
<i>R.Ya. Tugazakov</i>	
Correlation of Flow in the Hypersonic Grad Boundary Layer	357
<i>A.L. Ankudinov</i>	
Estimation of Operating Conditions of the Mid-Range Aircraft Auxiliary Power Unit with Receiver Inlet in Turbulent Flow	365
<i>E.P. Bykov, E.V. Kazhan, & V.F. Tretyakov</i>	
Heuristic Model of Nonsteady Longitudinal Aerodynamic Characteristics at High Angles of Attack	395
<i>P.V. Kuzmin, B.A. Meleshin, Yu.F. Shelyukhin, & D.V. Shukhovtsov</i>	

Issue 5

Selection of the Rational Position of a Slotted Nozzle on the Airfoil with a System of Tangential Jet Blowing for Shock-Induced Separation Suppression	411
<i>A.V. Petrov & P.V. Savin</i>	
High-Temperature Carbon Dioxide Flow Over a Longitudinal Cylinder	423
<i>V.Ya. Borovoy, I.V. Egorov, E.G. Zaitsev, A.S. Skuratov, & I.V. Sruminskaya</i>	
Optimal Design of the Nacelle Assembly under the Wing of an Airliner Based on RANS Numerical Simulations	439
<i>N.A. Zlenko & I.A. Kursakov</i>	
Thermodynamic Analysis of Dual-Mode Scramjet Combustor Operation	465
<i>E.A. Meshcheryakov & V.V. Yashina</i>	
Maximum Principle for the Bernoulli Function	485
<i>V.N. Golubkin & G.B. Sizykh</i>	
About the Evaluation of Fatigue Characteristics in the Early Design Stages of Aircraft	491
<i>M.E. Basinov, E.V. Kasumov, S.V. Saltykov, & V.A. Shuvalov</i>	

Issue 6

New Method of Optical Investigations of Boundary Layer State in Aerodynamic Experiment	509
<i>M.A. Brutyany, A.V. Petrov, & A.V. Potapchik</i>	
The Refined Coles' Law of the Wake	519
<i>V.V. Mikhailov & N.V. Samoilova</i>	
Method of Optimal Aerodynamic Design of the Nacelle for the Main Propulsion System with a High Bypass Ratio	533
<i>N.A. Zlenko, S.V. Mikhaylov, A.A. Savelyev & A.V. Shenkin</i>	
Numerical Analysis of Single-Expansion Ramp Nozzle Performance in Supersonic Flow	559
<i>A.P. Mazurov</i>	

Method of Computations of Loads at the Design of Rotor Units and Helicopter Control System	577
<i>A.Yu. Barinov & N.S. Pavlenko</i>	
The Static Pressure Influence on Electrophysical Characteristics of a Dielectric Barrier Discharge	591
<i>M.D. Gamirullin, V.M. Litvinov, T.A. Pimenova, I.E. Rebrov, A.A. Uspenskii, & A.Yu. Urusov</i>	
Hydrogen Injection into a Supersonic Flow of Air in a Channel with Radial Pylons	609
<i>D.P. Alekseev & Yu.V. Tunik</i>	
Issue 7	
Influence of High-Bypass-Ratio Turbofan Jets on Aerodynamic Characteristics of High-Lift Wing	619
<i>A.V. Petrov & V.F. Tretyakov</i>	
Optimization of the Forebody of a Supersonic Flying Vehicle Configuration with a Windward Intake	631
<i>S.A. Takovitskii</i>	
Parametric Description of the Airfoil Using Combined Polynomial Functions for Optimization Applications	647
<i>N.V. Nikolaev</i>	
One Solution of the Navier-Stokes Equations: Spherically Symmetric Point Source in a Compressible Perfect Gas	657
<i>O.E. Kirillov</i>	
Criterion to Select Optimum Values of Aircraft Lateral Static Stability Margin in Landing Approach	671
<i>P. Desyatnik</i>	
Investigation of Crack Propagation Process by Measurements of Local Deformation Response: I. Actual Stress Field	687
<i>S.I. Eleonskii, I.N. Odintsev, V.S. Pisarev, & A.V. Chernov</i>	
Issue 8	
Elimination of the Cross-Flow Instability on the Swept Wing Boundary Layer by Means of Dielectric Barrier Discharge	715
<i>M.V. Ustinov</i>	
Energy Characteristics of Plasma Actuators for Boundary Layer Flow Control	733
<i>M.D. Gamirullin, A.P. Kuryachii, V.M. Litvinov, A.A. Uspenskii, & S.L. Chernyshev</i>	
Nonlinear Dependencies of Lift on the Angle of Attack in the Lifting-Line Theory	753
<i>A.A. Nikolsky</i>	

Effects of Transition Processes on Systematic Errors of Heat Measuring in Wind Tunnels	769
<i>E.P. Stolyarov</i>	
Improvement in Modeling Quality of Unsteady Processes when Using an Explicit Scheme with Fractional Time Stepping	783
<i>S. S. Molev</i>	
Investigation of Crack Propagation Process by Measurements of Local Deformation Response: II. Residual Stress Field	807
<i>A.A. Apalkov, S.I. Eleonsky, I.N. Odintsev, & V.S. Pisarev</i>	
Index to Volume 46	833

TSAGI SCIENCE JOURNAL

AUTHOR INDEX, VOLUME 6, 2015

Page Range of Issues; Issue 1: 1-85; Issue 2: 87-192; Issue 3: 193-305; Issue 4: 307-409; Issue 5: 411-507; Issue 6: 509-618; Issue 7: 619-714; Issue 8: 715-841

- | | | |
|--------------------------------|--------------------------------|------------------------------|
| Alekseev, D.P., 609 | Kuvshinov, V.M., 259 | Shelyukhin, Yu.F.,
395 |
| Anikin, V.A., 259 | Kuzmin, P.V., 395 | Shenkin, A.V., 533 |
| Animitsa, O.V., 259 | Leontiev, V.A., 259 | Shokolov, A.G., 43 |
| Ankudinov, A.L., 357 | Lipnitskii, Yu.M., 43 | Shukhovtsov, D.V.,
395 |
| Apalkov, A.A., 807 | Litvinov, V.M., 591,
733 | Shuvalov, V.A., 491 |
| Avershyev, S.P., 43 | Lyapunov, S.V., 1 | Shvedchenko, V.V.,
323 |
| Barinov, A.Yu., 577 | Lysenkova, N.B., 63 | Sizykh, G.B., 209,
485 |
| Bashkin, V.A., 107 | Makarevich, G.A., 43 | Skalkin, A.S., 43 |
| Basinov, M.E., 491 | Mamadaliev, N., 43 | Skuratov, A.S., 423 |
| Bazhenov, S.G., 63 | Manuilovich, S.V., 247 | Stepanov, V.A., 123 |
| Borovoy, V.Ya., 423 | Mazurov, A.P., 559 | Stolyarov, E.P., 769 |
| Bosnyakov, I.S., 1 | Meleshin, B.A., 395 | Struminskaya, I.V.,
423 |
| Brutyan, M.A., 509 | Melnikov, Ya.A., 123 | Takovitskii, S.A., 631 |
| Bykov, E.P., 365 | Meshcheryakov , E.A.,
465 | Teperin, L.L., 309 |
| Chedrik, V.V., 289 | Mikhailov, V.V., 193,
519 | Tretyakov, P.V., 43 |
| Chernov, A.V., 687 | Mikhaylov, S.V., 533 | Tretyakov, V.F., 365,
619 |
| Chernyshev, S.L.,
309, 733 | Molchanov, V.F., 219 | Troshin, A.I., 1 |
| Desyatnik, P., 671 | Molev, S.S., 783 | Tugazakov, R.Ya.,
345 |
| Dudin, G.N., 231 | Nguyen, P.H., 231 | Tuktarov, S.A., 289 |
| Efimtsov, B.M., 29,
143 | Nikitchenko, Yu.A., 75 | Tunik, Yu.V., 609 |
| Egorov, I.V., 107,
323, 423 | Nikolaev, N.V., 647 | Urusov, A.Yu., 591 |
| Eleonskii, 687, 807 | Nikolsky, A.A., 753 | Uspenskii, A.A., 591,
733 |
| Ezhov, I.V., 107 | Odintsev, I.N., 687, 807 | Ustinov, M.V., 715 |
| Gamirullin, M.D.,
591, 733 | Pavlenko, N.S., 577 | Vinogradov, V.A.,
123 |
| Golubev, A.Yu., 29,
143 | Pelipenko, L.F., 43 | Vladimirova, N.A., 17 |
| Golubkin, V.N., 485 | Petrov, A.V., 411, 509,
619 | Vlasenko, V.V., 1 |
| Kasumov, E.V., 175,
491 | Pimenova, T.A., 591 | Vozhdaev, V.V., 309 |
| Kazhan, E.V., 365 | Pisarev, V.S., 687, 807 | Wolkov, A.V., 1 |
| Kirillov, O.E., 657 | Polovnev, A.L., 43 | Yashina, V.V., 465 |
| Kiselev, A.F., 309 | Potapchik, A.V., 509 | Zaitsev, E.G., 423 |
| Kornilov, A.B., 55 | Rebrov, I.E., 591 | Zlenko, N.A., 439,
533 |
| Korolev, G.L., 87 | Saltykov, S.V., 491 | |
| Kulesh, V.P., 161 | Samoilova, N.V., 193,
519 | |
| Kursakov, I.A., 439 | Savelyev, A.A., 533 | |
| Kuryachii, A.P., 733 | Savin, P.V., 411 | |
| | Sboev, D.S., 309 | |

TSAGI SCIENCE JOURNAL

SUBJECT INDEX, VOLUME 6, 2015

Page Range of Issues; Issue 1: 1-85; Issue 2: 87-192; Issue 3: 193-305; Issue 4: 307-409; Issue 5: 411-507; Issue 6: 509-618; Issue 7: 619-714; Issue 8: 715-841

- "half power law," 519
3D intake, 123
accuracy order, 1
acoustic waves, 43
actuator model, 733
aerodynamic
 characteristics, 17
aerodynamic design, 533
aerodynamic drag, 631
aerodynamic experiment,
 509
aerodynamic heating, 107
aerodynamic performance,
 411, 619
aerodynamic wing
 characteristics, 161
airfoil, 17, 411, 647, 753
airliner, 63
angle of attack, 107, 395
asymptotic behavior, 769
asynchronous operation,
 63
auxiliary power unit, 365
axisymmetric body, 107
basic propulsion system,
 439
bending deformation, 161
Bernoulli integral, 485
blade deformations, 577
boundary layer on an
 oblique wing, 247
boundary layer, 231, 365,
 509
bow shock wave stand-off,
 423
bulk viscosity, 657
carbon dioxide, 423
CFD, 439
closure moments, 75
coefficient of pressure,
 123
combustor, 465
composite material, 289
computational
 aerodynamics, 365
computational fluid
 dynamics, 17
computational fluid
 dynamics, 309
computational fluid
 dynamics, 533
confirmation time, 63
conical spiral, 219
control system, 259
convolution, 657
crack compliance method,
 687, 807
critical heat supply, 465
cross correlation, 143
crossflow, 247
cylindrical spiral, 219
delta wing, 231
design, 491
designing, 175
dielectric barrier
 discharge, 591, 715, 733
differential equations, 577
diffusion, 609
digital fly-by-wire control
 system, 63
directional handling
 qualities criterion, 671
discontinuous Galerkin
 method, 1
distribution, 63
drag coefficient, 123
dual-mode scramjet, 465
electric power, 591, 733
electronic speckle
 interferometry, 687, 807
elliptic cylinder, 87
energy efficiency, 591
enthalpy, 423
EWT-TsAGI software
package, 365
experimental measuring,
 55
explicit scheme, 783
false alert, 63
finite-element method,
 289
flap, 365
flight simulator, 63
flight simulator, 671
flight tests, 161
flow downwash, 395
flow rate, 123
flow symmetry plane, 107
flow velocity, 591
forebody, 631
forward-facing
 step/backward-facing
 step combination, 29,
 143
fractional time stepping,
 783
Friedman velocity, 209
geometric parameters, 161
global cross-correlation,
 29
global time stepping, 783
Grad approximation, 357
heat flux density, 769
heat flux, 323, 423
high-aspect-ratio wing,
 289
high-lift wing, 619
high-speed helicopter, 259
high-speed impact, 43
hinge moment, 577
hole-drilling method, 807
hot-shot wind tunnel, 423
hydrogen-air mixture, 609
hypersonic flow, 107
hypersonic flow, 357
hypersonic flow, 423

hysteresis, 17
 ideal gas, 345
 identification, 395
 impulse transfer function, 769
 incompressible fluid, 87, 247
 intermittent wind tunnel, 769
 inverse heat transfer problem, 769
 irregular singularity, 657
 jet blowing, 619
 jet momentum coefficient, 411
 Kelvin–Helmholtz instability, 345
 kinetic boundary layer, 357
 laminar-turbulent transition, 309
 laminar–turbulent transition, 715
 lateral static stability margin, 671
 lift force, 395
 lifting time, 753
 local displacement measurements, 687
 longitudinal flow over a cylinder, 423
 low-level turbulence wind tunnel, 309
 main rotor, 17
 Martian atmosphere, 423
 maximum principle, 485
 meteoroid particles, 43
 method of discrete vortices, 209
 mixing of gas flows, 609
 moment equations, 75
 monitoring system, 63
 multispectral directional emissivity of material, 55
 nacelle, 439, 533
 Navier–Stokes equations, 87, 107, 209, 485, 657
 incompressible viscous fluid, 485
 noncontact measurements, 161
 non-contact measurements, 509
 nonstationary flow, 17
 nonsteady characteristic, 395
 nonsteady flow, 395
 nonuniform flow stagnation, 365
 normal shock wave, 465
 nozzle impulse vector, 559
 nozzle thrust vector, 559
 numerical experiment, 175, 491
 numerical method, 87, 559
 numerical simulation, 107
 optimization, 439, 533, 631, 647
 oscillations, 577
 parameterization, 647
 pitch moment, 395, 631
 plasma actuator, 591
 plate–beam analogy, 289
 polyatomic gases, 75
 pressure fluctuations, 29, 143
 pressure, 323, 423
 pressurized compartment, 43
 probability, 63
 punching (breakdown), 43
 pylon, 439, 609
 receiver, 365
 redundancy, 63
 reflection hologram interferometry, 807
 relaminarization, 193
 residual stress, 807
 Reynolds equation system, 1
 Richtmyer–Meshkov instability, 345
 rotor, 577
 separation, 87, 345
 shock-induced separation, 411
 short-wave instability, 75
 similarity parameters, 769
 single-expansion ramp nozzle, 559
 skin friction coefficient, 193
 slotted nozzle, 411
 small perturbations, 323
 source, 657
 space debris, 43
 spacecraft, 43
 stability and controllability, 259
 static pressure, 591, 733
 steady solution, 87
 strain–stress state analysis, 491
 strength, 175, 491
 stress intensity factor, 687, 807
 stress–strain analysis, 175
 strong viscous-inviscid interaction, 231
 structural modeling, 289
 supersonic passenger aircraft, 123
 SVS-2 wind tunnel, 365
 swept wing, 715
 swirling flow, 209
 tangential jet blowing, 411
 test flights, 63
 the wake law, 519
 thermographic system, 55
 thin body, 357
 threshold, 63
 torsion, 161
 total pressure loss, 465, 609
 total pressure probe, 591, 733
 transition process, 769
 transition trips, 509
 translational nonequilibrium, 357
 transport aircraft, 671
 T-stresses, 687, 807
 turbulence model, 1, 309
 turbulence, 609
 turbulent boundary layer, 519
 turbulent near-wall flow, 193
 two-dimensional problem,

357
two-layered environment, 769
unsteady process, 783
velocity profile, 733

videogrammetry, 161
viscosity, 609
viscous gas, 559
volume force, 247
volumetric force, 591, 733

vortex filament, 219
vortex, 345
V-shaped wing, 345
welded joints, 807
wing, 309, 753