Ioan URSU

1. Ph. D. Mathematics, Senior Researcher, CS I

Mailing Address

INCAS - "Elie Carafoli" National Institute for Aerospace Research
Bd. Iuliu Maniu 220, Bucharest 061126, Romania
Phone: + 4021 434 00 83; +40788 017 798
Fax: + 4021 434 00 82
E-mail: ursu.ioan@incas.ro, ioanursu2003@yahoo.com
Web site: www.incas.ro; https://scholar.google.com/citations?user=jEE7cjQAAAAJ&hl=en
https://orcid.org/0000-0003-0529-6595
https://bulletin.incas.ro/editorial_board.html
my scholarly statistics are: h-index = 16; i10-index=30; 989 citations (09 04 2024), **44 Publications in Web of Science**

2. SCHOOLING

High School Aurel Vlaicu, Orastie, 1964
University of Bucharest, Department of Mathematics: **B.S., Fluid Mechanics, 1969**
Polytechnic Institute of Bucharest, Department of Automatic Control: **Graduate studies, 1985-1986**
"Simion Stoilow" Institute of Mathematics of Romanian Academy: **Ph D, Mathematics, 2000**

3. EMPLOYMENT

1969-to date: INCAS - "Elie Carafoli" National Institute of Aerospace Research, Bucharest (formerly IMFDZ, formerly INCREST, formerly IMFCA, formerly ICPAS)
1969: Assistant Researcher; 1972: Scientific Researcher; 1977: CS III; 1990 CS II; 2017- CSI; 1995-2008: Head of INCAS Systems Analysis Department; 2008-2010: Head of INCAS Mechatronics Department; 2010-2014: Head of INCAS Systems Department; member of INCAS Scientific Council: 2008-to date; president of INCAS Scientific Council: 2016-2020, vice-president of INCAS Scientific Council: 2023 -

4. PROFESSIONAL EXPERIENCE

4.1. Specialization

(i) basic specialization

Analysis, synthesis, qualification testing and flight clearance for aircraft and helicopters hydraulic servomechanisms
From 1969, I was directly involved in all Romanian aviation projects, including IAR93 and IAR99 military jets, Puma and Alouette helicopters, and Romanian flight simulator projects. Contributions in the design and manufacturing of hydraulic servomechanisms for all these projects

(ii) research interest

Electrohydraulic and electromechanical actuators design; active and semiactive control; anti blocking systems (ABS); smart aerospace structures; structural health monitoring (SHM); stability robustness and performance robustness – analysis and synthesis; linear and nonlinear control synthesis: LQG control, backstepping control, sliding mode control, geometric control; adaptive control synthesis; intelligent control synthesis: neural control, fuzzy control

4.2. Internal Research Reports

Over 250, from 1970, until now

5. PERSONAL HONOURS AND AWARDS

♦ Chair and co-chair in several national and international conferences

♦ Co-author of "Dynamic Systems Control Methods" group of works awarded with Romanian Academy 1998 "Aurel Vlaicu" Prize

♦ Romanian Academy 2002 "Aurel Vlaicu" Prize, awarded in 2004 for the book *Active and semiactive control* (Romanian Academy Publishing House, 2002)

♦Award for Excellence: *Aircraft Engineering and Aerospace Technology*, 1998, Great Britain; Who'sWho in Science and Engineering (2006-2007 Edition)

♦Gold Medal for the patent no. RO131152B1/2017 "Procedeu complex de identificare online a defectelor mecanice în spectroscopia impedanței electromecanice, cu evitarea diagnozelor false (Complex process for on-line identification of mechanical faults in electromechanical impedance spectroscopy while preventing false diagnosis)", inventors: D. Enciu, I. Ursu, M. Tudose, awarded at the 46th Edition of the International Invention Salon held at Geneva, Switzerland, 11-15 April 2018, Gold Medal

♦Special Prize from the Turkish Patent and Trademark Office for the patent no. RO131152B1/2017 Procedeu complex de identificare online a defectelor mecanice în spectroscopia impedanței electromecanice, cu evitarea diagnozelor false (Complex process for on-line identification of mechanical faults in electromechanical impedance spectroscopy while preventing false diagnosis)", inventors: D. Enciu, I. Ursu, M. Tudose, awarded at the 46th Edition of the International Invention Salon held at Geneva, Switzerland, 11-15 April 2018

6. PROFESSIONAL AND SCIENTIFIC SERVICE AND EXPERTISE

6.1. Professional Societies Memberships: Member GAMM (Gesellschaft für Angewandte Mathematik und Mechanik), Germany; Member ROMAI (Romanian Society of Applied and Industrial Mathematics); Member Literati Club-MCB University Press (Bradford, Great Britain)

6.2. Reviewer to National and International Journals: INCAS Bulletin, Romania; Journal of The Franklin Institute, Elsevier, Philadelphia, USA (ISI); American Society of Mechanical Engineers (ASME) Journals, USA; Journal of Vibration and Control, SAGE, USA (ISI); International Journal of Control, Automation, and Systems, South Korea (ISI); Mechatronics (ISI); Aerospace Science and Technology (ISI); Sensors (ISI); IEEE Transactions on Automation Science and Engineering (ISI); Journal of Aerospace Engineering (ISI), Nonlinear Dynamics (ISI); Journal of Aircraft (ISI) etc.

6.2. Member of Journal Boards

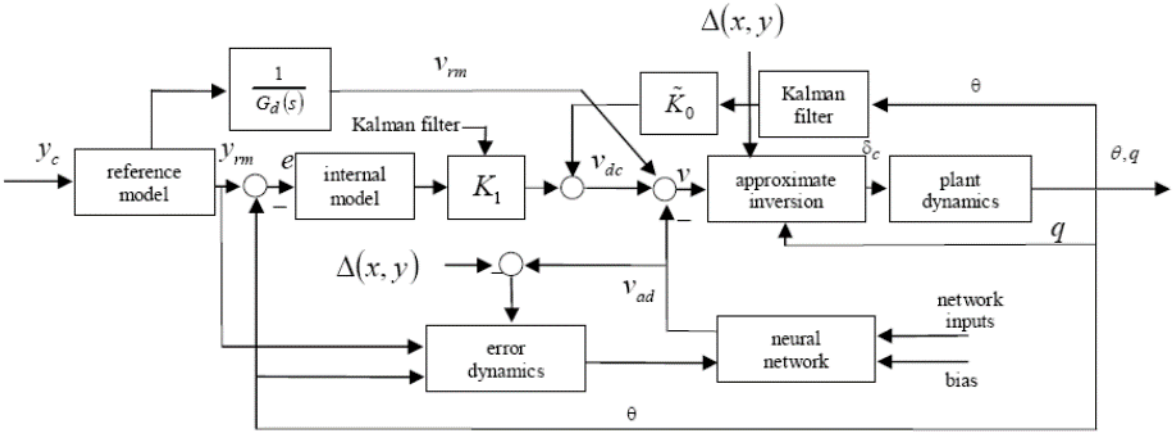
INCAS Bulletin, ACTUATORS (mdpi Journal, IF 2.523)

6.3. Scientific Expertise

– a short listing of the main research contributions –

- *"Active and semiactive control"* (2002), in Romanian, authors I. Ursu, F. Ursu (2002), **Romanian Academy Publishing House**, 356 pages, a book awarded with **Aurel Vlaicu Prize by the Romanian Academy** in 2004, an overview of the subject status around 2000. The text is thought as self-contained. The main perspective concerns problems such as: active and semiactive control of suspension systems, active and pseudoactive aeroservoelastic control, antisaturating and antichattering control, classical and artificial intelligence-based robust control synthesis. The book also shows the experience gained in the conception and realization of servomechanisms in the former aviation institute INCREST, the current INCAS.
- Two criteria of design the servo actuating flight controls are proposed in the paper *"About aeroservoelasticity criteria for electrohydraulic servomechanisms synthesis",* authors I. Ursu, M. Vladimirescu, F. Ursu, **Proceedings of 20th Congress of the International Council of the Aeronautical Sciences, ICAS 96**, vol. **2**, pp. 2335-2344: a criterion based on the servoactuator impedance function and a criterion determined by the active control of the flexible body modes of the aircraft.
- A method of designing the controller to solve the Robust Servomechanism Problem is proposed in the paper "*From robust control to antiwindup compensation of electrohydraulic servo actuators*" (1998), authors I. Ursu, F. Ursu, M. Vladimirescu, T. Sireteanu, **Aircraft Engineering and Aerospace Technology**, vol. 70, 4, 259-264 **Award for Excellence**, Great Britain. The method is based on the well-known paradigm consisting of two separate devices: a servocompensator, in fact an internal model of the exogenous dynamics, and a stabilizing compensator. The proof is made involving the servocompensator structure which is close to the one designed for step signals. The stabilizing compensator is assured by the way of a linear quadratic optimal procedure. An antiwindup compensation is added to deal with the adverse effects caused by actuator saturation.
- The absolute stability theory is used to derive sufficient absolute stability conditions for the equilibrium point of an inertial loaded electrohydraulic servo; see the paper "*About absolute stable synthesis of electrohydraulic servo*" (1999), authors I. Ursu, F. Ursu, T. Sireteanu (1999), **Technical Papers of AIAA (AIAA-99-4090)**, Guidance, Navigation and Control Conference, Portland, Oregon, USA, August 9-11, vol. **2**, pp. 848-858. The first condition represents a simplified approach, starting from the Lefschetz's inequality. The second condition represents an exactly approach, involving a stochastic framework. An extended criterion Popov-Morozan is obtained.
- Two pointing algorithms for the position control in the NOTTE experiment are presented in the paper "*Positioning Algorithms in the NOTTE Experiment*" (1999) authors I. Ursu, A. Plaian, F. Ursu, **Proceedings of ICALEPCS 99, International Conference on Accelerator and Large Experimental Physics Control Systems,** Trieste, Italy, October 4-8, CD published. One of them exploits the abilities of a predictor type Kalman estimator in a discrete time LQG synthesis, given the physical constraint of delayed incomplete state information.
- In a seminal paper "*Stability of equilibria in a four-dimensional nonlinear model of a hydraulic servomechanism*" (2004), authors A. Halanay, C. A. Safta, I. Ursu, F. Ursu, **Journal of Engineering Mathematics**, vol. 49 , 4, August, 391-405, a critical case of equilibria stability for a realistic, four dimensional, model of a mechanohydraulic servomechanism is revealed and then treated using Lyapunov-Malkin mathematical apparatus. Given the two features of electrohydraulic servomechanism − likely switching mathematical model disadvantaged once again by a critical stability − to whom is to be added the defect of relative degree, in a series subsequent papers the way of control synthesis will combine the geometric theory of nonlinear feedback and the classical Lyapunov-Malkin approach in a new configuration, that of the switched systems.
- A fuzzy logic controller for an airplane antilock-braking system (ABS) is presented in the paper "*Airplane ABS control synthesis using fuzzy logic*" (2005), authors I. **Ursu,** F. Ursu, **Journal of Intelligent & Fuzzy Systems** (USA), 16, 1, 23-32. The validated algorithm ensures the avoiding of wheel's blockage, even in the worst road conditions.
- A switching type neuro-fuzzy control synthesis for an electrohydraulic servo is proposed in the work "Neuro-fuzzy synthesis of flight controls electrohydraulic servo" (2001), authors **I. Ursu, F.** Ursu, F. and L. Iorga, **Aircraft Engineering and Aerospace Technology,** vol. 73, pp. 465-471. An experimental validation is recently reported: "*Neuro-fuzzy control synthesis for hydrostatic type servoactuators. Experimental results*" (2009), authors I. Ursu, G. Tecuceanu, A. Toader, C. Calinoiu, F. Ursu, V. Berar, **INCAS Bulletin**, vol. 1, 2, 136-150.
- In the paper "*Backstepping design for controlling electrohydraulic servos*" (2006), authors I. Ursu, F. Ursu, F. Popescu, **Journal of The Franklin Institute,** USA, vol. 343, January, 94-110, it is clarified how the standard theory of backstepping can produce a controller for a complex plant such as an electrohydraulic servo.
- The paper "H_∞ *control with* μ *-analysis of a piezoelectric actuated plate*" (2009), authors Iorga, L., H. Baruh, I. Ursu, **Journal of Vibration and Control,** vol. 15, 8, August, 1143-1171**,** develops a multimodal active H_∞ controller for piezoelectric actuated plates. The closed-loop control scheme is subject to both uncertainties due to control and observation spillover in the unmodeled residual modes and to parametric errors in the structural model. The closed-loop stability and performance robustness is analyzed using μ -analysis.

♦ The work "*A unitary approach on adaptive control synthesis*", (2010), authors I. Ursu, A. Toader, **Mathematics and Computers in Science and Engineering, A Series of Reference Books and Textbooks,** Edts. A. Khallel *et al.*, A. Hassairi, proposes a unitary approach of adaptive output feedback control for non-affine uncertain systems, about which the only knowledge refers to the relative degree *r*.



Implementation block diagram of neural network based adaptive control

♦The paper "Pilot modeling based on time delay synthesis", authors A. Toader, I. Ursu, **Proceedings of the Institution of Mechanical Engineers - Part G: Journal of Aerospace Engineering**, **227**, 4, 2013, defines the pilot model synthesis in the framework of rigorous time-delay synthesis (see the next Figure). The problem is then solved by making reference to the control separation and duality principles. A closed-form expression of the solution is thereby obtained. The proposed model was then compared by numerical simulations with Kleinman and Hess consecrated models. The analysis of the results shows that this new pilot model is described by a simplified representation, instead denoting similar performance versus previous optimal models – which contains complicated insertions, as Kleinman–Baron predictor or Padé approximation, respectively. Finally, joint evaluation of the proposed model and Kleinman and Hess models with respect to the well-known Neal–Smith criterion confirms the consistency and viability of the employed strategy as a possible tool for pilot-induced oscillations phenomenon investigation.

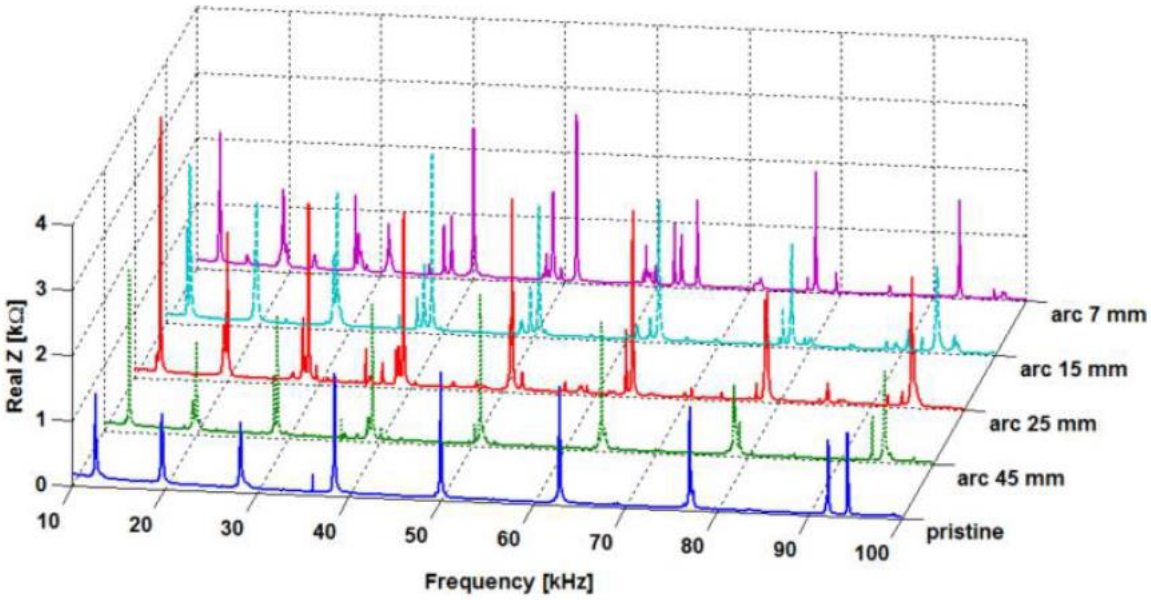
♦ The article "*New stabilization and tracking control laws for electrohydraulic servomechanisms* ", authors I. Ursu, A. Toader, S. Balea, A. Halanay, appeared in the latest issue of the prestigious European Journal of Control, **19**, 1, 2013, © Elsevier. The same number present *Discussions* on the article, plus replica of the first author, Ioan Ursu. **We present quotes from the comments of some the reputable specialists.**

- **Tingwen Huang (Texas A & M University at Qatar)**: "A novel way is provided to deal with the problem of the stabilization and tracking control for EHSs. Overall, paper provides a creative way to design the control laws for issues of the EHSs stabilization and tracking control, this study also opens several new gates for the further investigation of electrohydraulic servomechanisms (EHSs) to improve the performance of the closed-loop EHSs."
- **MingQing Xiao (Southern Illinois University):** "It is interesting to note that after a feedback control is proposed by geometric approach, numerical simulations offered by the authors show the effectiveness for some tracking cases by using a feedback control similar to the stabilization one…In the main part, the authors present a solution of the tracking problem via backstepping approach for two types of typical tracking signals. The approach is directly based on the original system, and thus the obtained result has a better convergent performance than those by making use of geometric method, as expected. For other types of tracking signals, the proposed approach seems remain valid under some suitable assumptions. While it would appear that electrohydraulic servocontrols have reached a point where a major structural change seems unlikely, this article leads to some interesting points for a further consideration in terms of controls of EHSs."

♦ The article "New Results Concerning SHM Technology Qualification for Transfer on Space Vehicles", authors Enciu Daniela, I. Ursu, A. Toader, **Structural Control and Health Monitoring**, 2017, vol. 24, nr 10, https://doi.org/10.1002/stc.1992, e1992 reports some results of recent complex tests on the survival of Structural Health Monitoring (SHM) technology based on Piezo Wafer Active Sensors (PWAS) and Electromechanical Impedance Spectroscopy (EMIS) method. Successive and then concomitant action of harsh conditions of outer space, extreme temperatures and radiations, were simulated in laboratory. The tests were conducted separately on PWAS and aluminum discs

as structural specimens, with PWAS bonded on them. The substantiating of the mentioned method consists in the fact that the real part of the bonded PWAS impedance spectrum, the so called EMIS structure signature, follows with fidelity the resonance behaviour of the structure vibrating under the PWAS excitation and, consequently, the onset and progress of structural damages. The conclusion of the tests is that the cumulative impact of severe conditions of temperature and radiation did not generate the decommissioning of sensors or adhesive, which would have meant the methodology compromising. This conclusion occurs as a result of applying two new analysis methods to EMIS signatures. A first method, based on systematic observation of EMIS signatures during tests, makes it possible to distinguish the real damages, of mechanical origin, by the false ones, defined by changes caused by harsh environmental factors on the same signature. A second method, based on the concept of entropy, shows how it is possible to identify mechanical damages at a certain distance by active piezo sensor and, moreover, proved by calculation that the investigated structural specimens passed the test of SHM technology survivability.

♦ In the article Towards structural health monitoring of space vehicles, Ursu, I., Daniela Enciu, A. Toader (2016), Aircraft Engineering and Aerospace Technology, vol. 89, nr. 6, 920-927, 2017 https://doi.org/10.1108/AEAT-07-IF 0.519, The question of transfer of PWAS-EMIS-based SHM technology to space vehicles and applications received, as a novelty, a first and encouraging response.



Notes: Comparative view of pristine specimen versus four damaged specimens

6.4. Funded Research Projects

Experience (including managerial experience) in other national/international programmes/ projects:

Programme/Project	Position	Period	Budget
– "Variational processes in optimal control with free final time", Contract 6107, code CNCSIS 252	Director of Grant	2000-2002	20 000 000 lei
"Periodical solutions for nonlinear differential systems and equations with small parameters"Contract 33 457/2002, code CNCSIS 251	Director of Grant	2001-2003	70 000 000 lei
"Antiwindup control synthesis methodologies for aerospatial systems"PNCDI 1 AEROSPATIAL, Contract 54/2002, code ASR 54	Director of Project	2003-2004	681 500 000 lei
"Electrohydraulic system for movement control" PNCDI 1 AEROSPATIAL, Contract 85/2003, code ASR 31 015	Director of Project	2003-2004	3 678 258 000 lei
"Adaptive synthesis of aerospace systems based on artificial intelligence technics"PNCDI 1 AEROSPATIAL, Contract 146/2004, code ASR 41 091	Director of Project	2004-2006	140 000 RON

Analysis and conversion modules for logical and hybrid control schemas with applicability to CANDU type nuclear power plants", PNCDI 1 MENER, SubContract RAAN-SITON 168/21 09 04	Responsible of Project	2004-2006	180 000 RON
"Designing of a hydrostatic servoactuator for aicrafts", PNCDI2 of Project 81 036 SAHA	Director of Project	2007-2010	1 163 305 RON
"Development of complex active and semiactive control systems" PNCDI2 Project 71 028 DESCAS	Director of Project	2007-2010	1 047 352 RON
"Intelligent system for simultaneous control and monitoring of structures", PNCDI2 Project 81 031 SIMOCA	Director of Project	2007-2010	1 660 000 RON
"Researches concerning robust and antisaturating control using fuzzy logic and neural networks, with applocations", Project PN-II UEFISCSU ID 1391/2008	Director of Project	2008-2011	900 000 RON
Advanced strategies for high performance indoor Environmental QUAliTy in Operating Rooms, PN-II-PT-PCCA-2011-3.2-1212 EQUATOR	Responsible of Project	2012-2015	570 000 RON
Structural health monitoring in spacecraft structures using piezoelectric wafer active sensors, STAR ID 188	Responsible of Project	2012-2015	1 000 000 RON
Innovative strategies of HVAC systems for high indoor environmental quality in vehicles, PN –II t 264/2014 INSIDE	Responsible of Project	2012-2016	175 000 RON
Antiflutter demonstrator with piezoelectric actuation Contract 289/2014 for the project PN-II-PT-PCCA-2013 AFDPA	Director of Project	2014-2016	1 250 000 RON
PN-III-P1-1.2-PCCDI-2017-086, Emerging technologies to counteract the effects induced by the turbulent flows of fluid media, 2018-2021 CONTUR	Responsible of Project	2018-2020	2 000 000 RON
PN III Ctrct. 611PED/2022 „Sistem inovator inglobat in fotoliile de la bordul aeronavelor comerciale pentru reducerea transmisiei SARS-CoV-2" – acronim SAFE (Innovative seating system to reduce SARS-CoV-2 transmission on board of commercial aircrafts) SAFE	Responsible of Project	2022-2024	108 000 RON
International Project EC FP6 CESAR Cost Effective Small Aircrft	Subtask Leader	2006-2010	1 422 750 euro, a part
Programul STAR C3 2016 ADVANCED AIR DIFFUSION SYSTEM OF THE CREW QUARTERS FOR THE ISS AND DEEP SPACE HABITATION SYSTEMS (QUEST)	Responsible of Project	2017-2019	100 000 a part
International Project Clean Sky, Cleansky SMART Fixed Wing Aircraft and Cleansky robust AFC	Subtask Leader	2008-2013	9 000 000 euro, a part

♦ Director of PNCDI2 Project 81 036 – "Designing of a hydrostatic servoactuator for aicrafts", 2007-2010, Project in the framework of PNCDI II Programme of Ministry of Education and Research

Summary. There are essentially two types of electrohydraulic servoactuators: some are controlled through electro-hydraulic servovalve, others, through pump – the so-called hydrostatic servoactuator. The first type is classical, with certain advantages, among them, a faster time constant. The shortages specific to this type – energy waste, high cost for the servovalve, the necessity for a hydraulic power highway – can be counteracted through the new system, the hydrostatic servoactuator, that constituted the object of this project. This one is based on the direct connection of the hydraulic cylinder to the pump; thus, the direction of the pump rotation determines the flow rate (a closed circuit) from the pump to the hydraulic cylinder and from the hydraulic cylinder to the pump. Adding an external position loop, a servomechanism (a tracking system) is obtained. The usual internal loop for pump angular speed was avoided by static error decreasing reasons. The external loop was initially studied and then synthesized and simulated by various control laws, classical (LQG, backstepping, geometric) or unconventional (neuro-fuzzy), having as performance criterion the dynamic transients optimization, in fact, the decreasing of time constant of the system. Finally, the studies and experimental results showed that the neuro-fuzzy control not only extends the system bandwidth, but also provides excellent control performance on contrast with various classical control strategies in hydraulic servo position systems. The most meaningful feature of the nonconventional controller, experimentally validated, is the following: because is in fact a free model strategy, this methodology ensures a reduced design complexity and provides antisaturating and antichattering properties of the controlling system, thus favourising its robustness. The experimental value of the time constant: 0.08 s, versus the theoretical one: 0.09 s.

♦Director of PNCDI2 Project 71 028 – "Development of complex active and semiactive control systems", 2007-2010, Project in the framework of PNCDI II Programme of Ministry of Education and Research

Summary. The project has had as object the development, both from theoretical and experimental viewpoint, of some complex active vibration systems. The vibrations can evolve as harmful or even catastrophic phenomenon, in various physical systems, such as aerospatial vehicles, machine-tools, buildings and bridges in the presence of seismic movements etc. In fact, in the project have been proposed efficient and robust solutions and associated algorithms for semiactive and active vibration control, and also the experimental models for testing. Semiactive control can only dissipate power by means of a controllable damper. Active control is capable of both supplying and dissipating power through an actuator. In the project have been taken into account especially robust and antisaturating control solutions. First, antisaturating and antichattering semiactive control laws were considered. Secondly, Hinfinity and neuro-fuzzy active control laws were elaborated. For validation, two representative controlled systems have been performed as experimental models: the system with finite degree of freedom (two) – active vibration isolation system, and the system with infinite degree of freedom, represented by the elementary model of a cantilevered plate. Thus, three mechatronic laboratory test systems have been realized, two active systems and a semiactive one. Finally, the studies and experimental results showed that the neuro-fuzzy control provides excellent control performance on contrast with various classical control strategies. The most meaningful feature of the nonconventional controller, experimentally validated, is the following: because is in fact a free model strategy, this methodology ensures a reduced design complexity and provides antisaturating and antichattering properties of the controlling system, thus favourising its robustness. Main applications are seen in aeronautics control field but also in other areas from civil structures to robotics.

♦ Director of PN-II-PT-PCCA-2013 AFDPA "Antiflutter demonstrator with piezoelectric actuation. *Contract 289/2014"*

Summary. This project develops an advanced system for active flutter and vibration control and gust alleviation for critical aerospace applications. The practical implementation of this active flutter and vibration control approach is done through the use of high-bandwidth piezoelectric actuation embedded into a "smart wing" design. The outcome of the proposed project is a methodology and experimental confirmation of a smart-wing solution for flutter vibration control and gust alleviation.

7. PUBLICATIONS

Books

[B1] Ursu, I., Felicia Ursu (2002), Active and semiactive control (in Romanian), *Publishing House of the Romanian Academy*, 356 pages.

[B2] Ioan Ursu, 30 years without Noica. Exercises of love (in Romanian, 30 de ani fara Noica. Exercitii de iubire). Editura Scrisul Romanesc, Craiova, aprilie 2017.

[B3] Hoinare splendori, 2023, Ed. Amurg Sentimental

Book Chapters

[B4]. Halanay, A., I. Ursu (2010): *Stability analysis of equilibria in a switching nonlinear model of a hydrostatic electrohydraulic actuator*. A chapter in *Mathematical Problems in Engineering Aerospace and Science*, volume 5, S. Sivasundaram (Ed.), Cambridge Scientific Publishers, ISBN 978-1-904868-79-8.

[B5] Toader, A., I. Ursu, *Towards a PIO II criterion: Improving the pilot modeling*, in Advances in Intelligent Systems and Computing Volume 187, 2013, pp 45-57, Springer-Verlag Berlin Heidelberg 2013 ISSN: 2194-5357 (Proceedings of the 2011 International Conference on Communication, Electronics and Automation Engineering http://link.springer.com/chapter/10.1007/978-3-642-32548-9_4#page-2**)**

[B6] Ursu, I., A. Toader, V. Chiroiu, S. Radnef, E. Popa, Intelligent adaptive type control for uncertain systems a chapter book in *Inverse Problems and Computational Mechanics*, vol. 1, 369-388, Romanian Academy Publishing House, 2011, ISBN 978-973-27-2147-6

[B7] C. Rugina, I. Ursu, The electromechanical impedance spectroscopy method on thin plates, in in *Inverse Problems and Computational Mechanics*, vol. II, 295-322, Romanian Academy Publishing House, 2011, ISBN 978-973-27-2708-9

[B8] Ioan Ursu, Mihai Tudose, Daniela Enciu, *Qualification of PWAS based SHM technology for space applications*". A chapter in the book STRUCTURAL HEALTH MONITORING FROM SENSING TO PROCESSING, InTechOpen, 2018

Patents

1. Patent no. 127329/30.07.2014 granted by the State Office for Inventions and Trademarks OSIM, Holder INCAS Bucharest, title of invention: **Aviation hydrostatic servoactuator**, authors: **Ioan Ursu**, Minodor Arghir, Adrian Toader, George Tecuceanu, Constantin Calinoiu.

2. D. Enciu, **I. Ursu**, M. Tudose, **Procedeu complex de identificare online a defectelor mecanice în spectroscopia impedanței electromecanice, cu evitarea diagnozelor false** (Complex method for online identification of mechanical damages using the electromechanical impedance spectroscopy, avoiding the false diagnosis), Patent no. 131152/29.12.2017.

3. I. Ursu, G. Tecuceanu, D. Enciu, A. Toader, M. Arghir, D. D. Guta Ion, D. Pepelea, C. Stoica, A. Dragos, **Procedeu complex de control activ al vibratiilor aripii de avion in prezenta turbulentei, pe baza unei metodologii emergente de identificare a modelului matematic** (Complex procedure for active control of aircraft wing vibrations in the presence of turbulence, based on an emerging methodology for identifying the mathematical model), A 2021 00378/30.06.2021

Extract List - Journal Articles in WoS Archival Journals

[34] D. Enciu, A. Toader, I. Ursu (2024), Further Results on the Input-to-State Stability of a Linear Disturbed System with Control Delay, Mathematics 2024, 12(5), 634; **IF. 2.4**

[33] A. Toader, I. Ursu, D. Enciu, G. Tecuceanu, Towards nonconservative conditions for equilibrium stability. to switching systems with control delay, Communications in Nonlinear Science and Numerical Simulation 121 (2023) 107188, **IF 4.186**, https://doi.org/10.1016/j.cnsns.2023

[32] D. Enciu, A. Halanay, A. Toader, **I. Ursu** (**2022**) Lyapunov-Malkin type approach of equilibrium stability in a critical case applied to a switched model of a servomechanism with state delay, International Journal of Control, https://doi.org/10.1080/00207179.2022.2156929, **IF 2.102**

[31] D. D. Ion-Guță, **I. Ursu**, A. Toader, D. Enciu, P. A. Dancă, I. Năstase, C. V. Croitoru, F. I. Bode, M. Sandu (**2022**) Advanced thermal manikin for thermal comfort assessment in vehicles and buildings, Applied Sciences, vol. 12, issue 4, pp. 1826; https://doi.org/10.3390/app12041826, **IF 2.838**

[30] I. Ursu, D. Enciu, G. Tecuceanu (**2019**), Equilibrium stability of a nonlinear structural switching system with actuator delay, Journal of the Franklin Institute, vol 357, no. 6, pp. 3680-3701, 2020-3 DOI: 10.1016/j.jfranklin.2020.02.035, **IF 4.504**

[29] D. Enciu, A. Halanay, **I. Ursu** (**2018**) Delay differential equation models for mechano and electrohydraulic servomechanisms used in airplane flight control, *UPB Scientific Bulletin*, Series A, vol. 80, Issue 3, **IF 0.279**

[28] D. Enciu, **I. Ursu**, A. Toader (**2017**), New Results Concerning SHM Technology Qualification for Transfer on Space Vehicles, *Structural Control and Health Monitoring*, vol. 24, issue 10, e1992, https://doi.org/10.1002/stc.1992, **IF 3.622**

[27] Ursu, I., Daniela Enciu, A. Toader (**2017**), Towards structural health monitoring of space vehicles, *Aircraft Engineering and Aerospace Technology*, vol. 89, nr. 6, 920-927, 2017 https://doi.org/10.1108/AEAT-07-**IF 0.519**

[26] C. Rugina, A. Toader, V. Giurgiutiu, **I. Ursu** (**2014**), The electromechanical impedance method for structural health monitoring of thin circular plates, *Proceedings of the Romanian Academy, Series A, Mathematics, Physics, Technical Sciences, Information Sciences*, **15**, 3, pp. 272–282, 2014. **IF. 1.658**

[25] Toader, A., **I. Ursu** (**2014**), Pilot modeling based on time delay synthesis, *Proceedings of the Institution of Mechanical Engineers - Part G: Journal of Aerospace Engineering (Proc IME G J Aero Eng)*, **228**, 5, pp. 740-754.

[24] Ursu, I., A. Toader, S. Balea and A. Halanay (**2013**), New stabilization and tracking control laws for electrohydraulic servomechanisms, *European Journal of Control ,* **19**, 1, pp. 65-80.

[23] Ursu, I., V. Chiroiu, L. Munteanu **(2012)**, Hysteresis modeling and feedforward control of a five-story system, *Proc. of the Romanian Academy, Series A: Mathematics, Physics, Technical Sciences, Information Science*, **13**, 1, 55-61, 2012.

[22] Ursu, I., G. Tecuceanu, A. Toader, C. Calinoiu **(2011)**, Switching neuro-fuzzy control with antisaturating logic. Experimental results for hydrostatic servoactuators, *Proceedings of the Romanian Academy, Series A, Mathematics, Physics, Technical Sciences, Information Science*, **12**, 3, 231-238.

[21] Ursu, I., G. Tecuceanu, A. Toader, Adaptive control of uncertain systems: a new unitary approach (**2010**), *Proceedings of the Romanian Academy, Series A, Mathematics, Physics, Technical Sciences, Information Science*, **11**, 3, 236-244.

[20] Balea, S., A. Halanay, **I. Ursu (2010),** Coordinate transformations and stabilization of some switched control systems with application to hydrostatic electrohydraulic servoactuators, *Control Engineering and Applied Informatics,* **12**, 3, 67-72.

[19] Halanay, A. and **I. Ursu (2009)**, Stability of equilibria of some switched nonlinear systems with applications to control synthesis for electrohydraulic servomechanisms, *IMA Journal of Applied Mathematics*, 74, 3, June, 361-373. **IF. 0.701**

[18] Halanay, A., C. A. Safta, F. Ursu and **I. Ursu (2009)**, Stability analysis for a nonlinear model of a hydraulic servo in a servoelastic framework, *Nonlinear Analysis: Real World Applications*, 10, 2, April, 1197-1209. **IF. 2.138**

[17] Iorga, L., H. Baruh, **I. Ursu (2009),** H_∞ control with μ -analysis of a piezoelectric actuated plate, *Journal of Vibration and Control*, 15, 8, August, 1143-1171**. IF 0.722**

[16] S. Balea, A. Halanay, I. Ursu (**2009**), Stabilization through coordinates transformation for switched systems associated to electrohydraulic servomechanisms, *Mathematical* Reports, 11, 4, 279- 292, 2009, ISSN: 1582-3067, Publisher: Romanian Academy, Publishing House of the Romanian Academy.

[15] S. Balea, A. Halanay, I. Ursu (**2009**), Stabilization through coordinates transformation for switched systems associated to electrohydraulic servomechanisms, *Mathematical Reports*, 11, 4, 279- 292, 2009, ISSN: 1582-3067, Publisher: Romanian Academy, Publishing House of the Romanian Academy, ISSN: 1582-3067

[**14**] T. Sireteanu, C. W. Stammers, M. Giuclea, **I. Ursu,** E. Guglielmino (**2001**), Semi-active suspension with fuzzy controller optimized by genetic algorithm **ISSN: 1582-3067** *Noise and Vibration Engineering*, **1- 3**, 133-139, 2001, ISBN: 90-73802-76-8.

[13] Iorga, L., H. Baruh, **I. Ursu (2008),** A review of H_∞ robust control of piezoelectric smart structures, *Transactions of the ASME*, *Applied Mechanics Reviews*, 61, 4, July, 17-31. **IF. 1.361**

[12] Munteanu, E., **I. Ursu,** A. Alecu **(2008),** Piezo smart wing with sliding mode control, *International Journal of Computers Communications & Control*, **3**, 417-421.

[11] Ursu, I., F. Ursu **(2007),** Control synthesis for electrohydraulic servos with parametric uncertainty, *Proceedings of the Romanian Academy Series a-Mathematics Physics Technical Sciences Information Science*, **8**, 1, 41-49.

[10] Halanay, A., **I. Ursu (2007),** Stability of equilibria in a model for electrohydraulic servomechanisms, *Mathematical Reports***,** 9 (59), 1, 47-54.

[9] Ursu, I., F. Ursu, F. Popescu **(2006),** Backstepping design for controlling electrohydraulic servos, *Journal of The Franklin Institute*, USA, 343, January, 94-110. **IF. 4.246**

[8] Ursu, I., F. Ursu **(2005),** Airplane ABS control synthesis using fuzzy logic, *Journal of Intelligent & Fuzzy Systems* (USA), 16, 1, 23-32.

[7] Ursu, I., F. Ursu (2004), A fuzzy logic control synthesis, for an airplane antilock-braking system, *Proceedings of the Romanian Academy, Series A, Mathematics, Physics, Technical Sciences, Information Science*, **5**, 2, January-April, pp. 187-196, 2004.

[6] Halanay, A., C. A. Safta, **I. Ursu**, F. Ursu **(2004),** Stability of equilibria in a four-dimensional nonlinear model of a hydraulic servomechanism, *Journal of Engineering Mathematics*, 49 , 4, August, 391-405.

[5] Ursu, I., Ursu, F. and Iorga, L. **(2001),** Neuro-fuzzy synthesis of flight controls electrohydraulic servo. *Aircraft Engineering and Aerospace Technology*, 73, pp. 465-471.

[**4]** Plaian, A., G. Tecuceanu, F. Ursu, **I. Ursu (2000)**, Inertially stabilized pointing control system, *Aircraft Engineering and Aerospace Technology*, **72**, 4, 358-364, 2000.

[3] Ursu, I., F. Ursu, T. Sireteanu **(1999),** About absolute stable synthesis of electrohydraulic servo*,* AIAA Guidance, Navigation, and Control Conference, **1-3**, 848-858*, Paper AIAA-99-4090.*

[2] Ursu, I., G. Tecuceanu, F. Ursu, M. Vladimirescu, T. Sireteanu **(1998),** From robust control to antiwindup compensation of electrohydraulic servo actuators, *Aircraft Engineering and Aerospace Technology*, 70, 4, 259-264, **Award for Excellence for outstanding paper, Literati Club-MCB University Press (Bradford, Great Britain).**

[1] Ursu, I., F. Ursu, M. Vladimirescu **(1997),** The synthesis of two suboptimal electrohydraulic suspensions, active and semiactive, employing the receding horizon method, *Nonlinear Analysis-Theory Methods & Applications*, **30**, 4, 1977-1984, 0362-546X/97

Papers in WoS Conference Proceedings

[C12] M. -R. Georgescu, A. Cernei, I. Nastase, P. Danca, D. Guta and I. Ursu, "Development and Use of a New Architecture of Thermal Manikin for Assessing Local Thermal Comfort," 2023 11th International Conference on ENERGY and ENVIRONMENT (CIEM), Bucharest, Romania, 2023, pp. 1-4, doi: 10.1109/CIEM58573.2023.10349780**.**

[C11] A. Dogeanu, I. Nastase, I. Ursu, D. Enciu, F. Bode, M. Sandu, C. Croitoru, S. Zaharia, G. Iana (**2019**) Real time monitoring network demonstrator for air quality management, Proceedings of 2019 International Conference on ENERGY and ENVIRONMENT (CIEM), Chapter Smart cities, Paper ID 139, doi:10.1109/CIEM46456.2019.8937625, IEEE Catalog Number: CFP19L60-ART, ISBN: 978-1-7281-1532-0 (ciem.energ.pub.ro)

[C10] I. Ursu, D. D. Ion Guta, D. Enciu, G. Tecuceanu, A. A. Radu (**2018**) Flight envelope expansion based on active mitigation of flutter via a V-stack piezoelectric actuator, IOP Conf. Series: Journal of Physics: Conf. Series, vol 1106,

[C9] D. Enciu, **I. Ursu**, G. Tecuceanu (**2018**) Dealing with input delay and switching in electrohydraulic servomechanism mathematical model, 5th International Conference on Control, Decision and Information Technologies (CoDIT), IEEE Xplore, pp. 713-718, DOI: 10.1109/CoDIT.2018.8394891, electronic ISSN: 2576-3555

[C8] Ursu, I. A. Toader (**2010)**, A unitary approach on adaptive control synthesis, Mathematical Methods, Computational Techniques and Intelligent Systems**,** pp. 71-78 (12th WSEAS Int. Conf. MAMECTIS '10), *Mathematics and Computers in Science and Engineering, A Series of Reference Books and Textbooks*, Edts.: A. Khallel, A. Hassairi, C. A. Bulucea, N. Mastorakis, ISBN: 978-960-474-188-5; ISSN: 1790-2769.

[C7] I. **Ursu**, E. Munteanu, Active control techniques for piezo smart composite wing (2008), *Proceedings of the 9th WSEAS International Conference on Automation and Information*, 554- 559, 2008, ISBN: 978-960-6766-77- 0

[C6] Munteanu, E., **I. Ursu** and C. Rugina (2008), Design of Active Control Laws for Implementing Structural Health Monitoring, 10th WSEAS Intern. Conf. MACMESE' 08) (published in „*Proceedings–Recent Advances in Mathematical and Computational Methods in Science and Engineering* – Part II, pp. 340-345").

[C5] Munteanu, E., **I. Ursu** and A. Alecu (2008), Piezo smart wing with sliding mode control, *International Journal of Computers, Communication and Control*, 3, pp. 417-421 (Proc. of ICCC 2008).

[C4] [C1] Munteanu, E., **I. Ursu** (2008), Design of robust active control for flutter alleviation, *19th International DAAAM Symposium „Intelligent Manufacturing & Automation: Focus on Next Generation of Intelligent Systems and Solutions".*

[C3] F. Ursu, **I. Ursu**, E. Munteanu, Adaptive backstepping type control for electrohydraulic servos (2007), Mediterranean Conference on Control & Automation, **1-4**, 90-95, 2007, T01-024, Athens, E-ISBN: 978-1-4244-1282-2, Print ISBN: 978-1-4244-1282-2

[C2] Munteanu, E. and I. Ursu (2008), Piezo smart composite wing with LQG/LTR control (2008), Proceedings of 2008 IEEE International Symposium on Industrial Electronics, Cambridge, England, CD published ISBN 978-1-4244-1666-0, pp. 1160-1165.

[C1] I. Ursu, F. Ursu, A. Halanay, S. Balea (2007), *Geometric control in a regulator problem for electrohydraulic servos*, *Mediterranean Conference on Control & Automation*, **1-4**, 1123- 1128, 2007, T23-027, Athens, E-ISBN: 978-1-4244-1282-2, Print ISBN: 978-1-4244-1282-2

Journal Articles in Peer-Review Archival Journals

53. I. Ursu, A. Toader, G. Tecuceanu, D. Enciu (2023) Input-to-state stability of a time-invariant system with control delay and additive disturbances, Proceedings in Applied Mathematics and Mechanics (PAMM), e202300152. https://doi.org/10.1002/pamm.202300152
52. L. Tirle, I. Ursu, D. Enciu (**2022**) Damage identification and localization in an aluminium plate based on lamb waves, International Journal of Modeling and Optimization (IJMO), vol. 12, issue 3, pp. 99-103, DOI: 10.7763/IJMO.2022.V12.808
51. I. Ursu, A. Toader, D. Enciu, G. Tecuceanu (**2022**) Active robust control for wing vibrations attenuation, INCAS Bulletin, vol. 14, issue 1, pp. 209 – 224, DOI: 10.13111/2066-8201.2022.14.1.17
50. Daniela Enciu, Ioan Ursu, George Tecuceanu, Dragos Daniel Ion Guta, Andrei Halanay, and Mihai Tudose (**2019**), *Flight Envelope Expansion Via Piezoelectric ActuationReceptance Method and Time-delayed Feedback Control*, International Journal of Modeling and Optimization, Vol. 9, No. 6, December 2019, pp. 317-321.
49. G. Tecuceanu, D. Enciu, I. Ursu (**2019**), *Equilibrium stability analysis by numerical simulations for a nonlinear system with time-delayed control*, INCAS Bulletin, vol. 11, issue 2, pp.179-193, DOI: 10.13111/2066-8201.2019.11.2.15
48. D. Enciu, I. Ursu, G. Tecuceanu (**2019**), *A problem of stabilization for the mathematical model of electrohydraulic servomechanism with control delay*, ARA Journal of Sciences, no. 2, pp. 39-42, DOI: 10.14510/ARAJ.2019.4226
47. Florin Bode , Iinca Nastase, Cristiana Croitoru, Mihnea Sandu, Angel Dogeanu, Ioan Ursu (**2018**), Preliminary Numerical Studies for the Improvement of the Ventilation System of the Crew Quarters on Board of the International Space Station, *INCAS Bulletin*, volume 10, issue 2, pp. 137-143, 2018.
46. D. Enciu, I. Ursu, G. Tecuceanu (**2018**) Dealing with input delay and switching in electrohydraulic servomechanism mathematical model, 5th International Conference on Control, Decision and Information Technologies (CoDIT), IEEE Xplore, pp. 713-718, DOI: 10.1109/CoDIT.2018.8394891, electronic ISSN: 2576-3555
45. M. Tudose, D. Enciu, I. Ursu (**2018**) Towards use of Fiber Bragg Grating sensors for structural health monitoring of (aero)space structures, International Journal of Modeling and Optimization (IJMO), vol,. 8, no. 4, pp. 246-249, ISSN: 2010-3697, DOI: 10.7763/IJMO.2018.V8.659
44. I. Nastase, I. Ursu, D. Enciu, V. Iordache, S. Zaharia, M. Gustiuc, C. Croitoru (**2018**), Real Time Monitoring Network System for Urban Air Quality Management, *Proc. of COBEE 2018*, pp.514-518, ISBN:978-0-646-98213-7
43. Ilinca Nastase, Cristiana Croitoru, Mircea Dan, Ioan Ursu, Amina Meslem (**2017**), *Experimental Study for the integration of an Innovative Air Distribution System in Operating Rooms*, *Energy Procedia*, 112 613 – 620, 2017.
42. D. Enciu, I. Ursu, M. Tudose (**2016**) *Towards Space applications of SHM technology relied on EMIS method*, Proc. of EWSHM 2016, vol. 21, no. 8, pp. 2052-2057, ISSN 1435-4934, ISBN 9781510827936
41. I. Ursu, D. D. Ion Guta, D. Enciu, A. Toader, M. Dan, C. Donciu, V. Turcan (**2016**), Mathematical modeling of a V-stack piezoelectric aileron actuation, *INCAS Bulletin*, volume 8, issue 4, pp. 141-155, 2016
40. A. Toader, I. Ursu, D. Enciu (**2015**), *New Advances in Space SHM Project*, INCAS Bulletin, volume 7, issue 1, pp. 65-80, 2015
39. I. Ursu, A. Toader, D. Enciu, D. M. Stefanescu (**2015**) *Advanced measurements in Star Space Project on structural health monitoring*, Proc. of XXI IMEKO World Congress 2015, pp. 2084-2087, ISSN 9781510812925
38. D. Enciu, A. Toader, I. Ursu (**2014**), Magnetic field nanosensor based on Mn impurities, *INCAS Bulletin*, vol. 6, no. 2, 2014, pp. 51-60, ISSN 2066 – 8201 DOI: 10.13111/2066-8201.2014.6.2.X
37. D. Enciu, G. A. Nemnes, I. Ursu (**2014**), Spintronic devices based on graphene nanoribbons with transition metal impurities. Towards space applications, *INCAS BULLETIN*, Volume 6, Issue 1/ 2014, pp. 45-56, ISSN 2066 – 8201
36. Balea, S., A. Halanay, I. Ursu (2013), New results on the problem of the stabilization of equilibria for models of electrohydraulic servoactuators, American Institute of Mathematical Sciences, (*AIMS) Journal Discrete and Continuous Dynamical Systems – series S*, vol. 6, no. 6, 2013, doi:10.3934/dcdss.2013.6.xx

35. I. Ursu, Ilinca Nastase, Sorin Caluianu, Andreea Iftene, George Tecuceanu, Adrian Toader (2013), Intelligent control of HVAC systems. Part II: perceptron performance analysis, *INCAS BULLETIN*, Volume 5, Issue 3/ 2013, pp. 127 – 135 ISSN 2066 – 8201

34. I. Ursu, Ilinca Nastase, S. Caluianu, Andreea Iftene, A. Toader (2013), Intelligent control of HVAC sysyems. Part I: Modeling and synthesis, *INCAS Bulletin*, vol. 5, no. 1, pp 103-118

33. I. Ursu (2012), The kinematics of the rigid feedback linkage, the impedance of the hydraulic servomechanism and the flutter occurrence**,** *INCAS Bulletin*, vol. 4, no. I. Ursu, V. Giurgiutiu, A. Toader (2012), Towards spacecraft applications of structural health monitoring, *INCAS Bulletin*, vol. 4, no. 4, pp. 111-124.3, pp 63-70.

32. Ursu, I., A. Toader (2011), On the synthesis of the pilot optimal control model, *INCAS Bulletin*, **3**, 3, 127-136.

31. Chiroiu, V., I. Ursu, L. Munteanu, T. Sireteanu, (2011), On the KP equation with hysteresis, *Fluid Dynamics & Materials Processing*, **279**, 1, 1-16.

30. Ursu, I. (2011), Dealing with mathematical modeling in applied control, *INCAS Bulletin*, **3**, 2, 87-93.

29. Ursu, I. (2011), PIO I-II tendencies. Part 2. Improving the pilot modeling, *INCAS Bulletin*, **3**, 1, 109-118.

28. Ursu, I. (2010), $H_{infinity}$ control synthesis with antisaturating compensator, *INCAS Bulletin*, **2**, 4, 203-211..

27. Balea, S., A. Halanay, I. Ursu (2010), Coordinates transformation and stabilization for switching models of actuators in servoelastic framework Applied Mathematical Sciences, **4**, 2010, no. 73 – 76, 3625-3642**.**

26. Ursu, I., A. Toader (2010), Control of uncertain systems by feedback linearization with neural networks augmentation. Part II. Controller validation by numerical simulation, *INCAS Bulletin*, **2**, 3, 107-116.

25. Ursu, I., G. Tecuceanu, A. Toader, V. Berar (2010), Simultaneous active vibration control and health monitoring of structures. Experimental results, *INCAS Bulletin*, **2**, 2, 114-127.

24. Toader, A., I. Ursu (2010), PIO I-II tendencies case study. Part 1. Mathematical modeling, *INCAS Bulletin*, **2,** 1, 91-102.

23. Ursu, I., G. Tecuceanu, A. Toader, C. Calinoiu, F. Ursu, V. Berar (2009), Neuro-fuzzy control synthesis for hydrostatic type servoactuators. Experimental results, *INCAS Bulletin*, **1**, 2, 136-150.

22. Ursu, I., A. Toader, G. Tecuceanu (2009), Control of uncertain systems by feedback linearization with neural networks augmentation. Part I. Controller design, *INCAS Bulletin*, **1**, 1, 84-89.

21. Ursu, I., F. Ursu, A. Halanay, C. A. Safta (2008), Equilibrium stability of a servo actuating flight controls in a servoelastic framework, *Acta Universitatis Apulensis*, 15, 179-189, received by Mathematical Reviews and ZBL.

20. Toader, A., I. Ursu (2007), Backstepping control synthesis for hydrostatic type flight controls electrohydraulic actuators, *Annals of the University of Craiova, Series Automation, Computers, Electronics and Mechatronics,* **4** (**31**), 1, 122-127.

19. I. Ursu, R. Cristea, F. Ursu (2007) , *Neurofuzzy control synthesis for an altitude hold autopilot, Annals of the Oradea University, Fascicle of Management and Technological Engineering*, Volume VI (XVI), 337-341, 2007, ISSN 1583 - 0691, CNCSIS "Clasa B+"

18. Ursu, I., F. Ursu, G. Tecuceanu, R. Cristea (2006), Fuzzy supervised neurocontrol of electrohydraulic servos, *PAMM Proceedings of Applied Mathematics and Mechanics*, **6,** 851-852.

17. Ursu, F., I. Ursu, L. Iorga (2006), New developments in robust synthesis with antiwindup compensation. Flight control actuators applications, *PAMM Proceedings of Applied Mathematics and Mechanics*, **6**, 849-850.

16. Ursu, I., G. Tecuceanu, F. Ursu, R. Cristea (2006), Neuro-fuzzy control is better than crisp control, *Acta Universitatis Apulensis*, 11, 259-269, (received by Mathematical Reviews and ZBL).

15. Ursu, I., F. Popescu, F. Ursu (2004), Control synthesis methodology related to an advanced nonlinear electrohydraulic servo system, *Proceedings of the Romanian Academy, Series A, Mathematics, Physics, Technical Sciences, Information Science*, **5**, 1, January-April, pp. 39-45.

14. Ursu, I., F. Ursu (2004), New results in control synthesis for electrohydraulic servos, *International Journal of Fluid Power*, **5**, 3, November-December, 25-38, © Fluid Power Net International FPNI and Tu Tech, TUHH Technologie Gmbh.

13. Ursu, I., F. Ursu (2004), An intelligent ABS control based on fuzzy logic, *Acta Universitatis Apulensis*, 7, 355-368, (received by Mathematical Reviews and ZBL).

12. Ursu, I., M. Stoia-Djeska, F. Ursu (2004), Active control laws for flutter suppression, *Annals of University of Craiova, Electrical Engineering Series*, Vol. 27, No. 27, pp. 62-70.

11. Ursu, I., F. Ursu, T. Sireteanu, C. W. Stammers (2000), Artificial intelligence based synthesis of semiactive suspension systems, *The Shock and Vibration Digest*, **32**, 1, 3-10, © Sage Publications.

10. Sireteanu, T., S. Bellizi, I. Ursu (1999), A new Gaussian equivalent linearization approach, *Revue Romaine des Sciences Techniques, Série de Mécanique Appliquée*, **442,** 3, 269-279.

9. Ursu, I., F. Ursu, (1999), The Combined Employing of Future Information in the Synthesis of Control Laws, *Universitatea din Pitesti, Buletin Stiintific, Seria Matematica si Informatica*, 3, 447-452.

8. Ursu, I., F. Ursu (1999), The combined employing of future information in the synthesis of control laws, *Turbo*, **III**, 1, 10-14, COMOTI-Publications.

7. Popescu, F., I. Ursu (1998), A Monte Carlo approach of the active suspension system stability, *Buletinul stiintific al Universitatii din Pitesti, Seria Matematica si Informatica*, 2, 151-156.

6. Halanay, A., I. Ursu (1997), An extended mathematical model for active vehicle suspension systems. Part I: A detailed LQG approach, *Revue Romaine des Sciences Techniques, Série de Mécanique Appliquée*, **42**, 3-4, 297-308.

5. Ursu, I., F. Ursu (1997), On mathematical modeling of hydraulic servos actuating primary flight controls (in Romanian), *Studii si cercetari de mecanica aplicata*, **56**, 5-6, 337-358.

4. Ursu, I., F. Popescu, M. Vladimirescu, R. Costin (1994), On some linearization methods of the generalized flow rate characteristic of the hydraulic servomechanisms, *Revue Roumaine des Sciences Techniques, Série de Mécanique Appliquée*, **39**, 2, 207-21.

3. Ursu, I., R. Costin, M. Besliu (1992), Dynamic performances analysis for an electrohydraulic tracking system (in Romanian), *Studii si cercetari de mecanica aplicata,* **51**, 4, 433-444.

2. Ursu, I., T. Panait, S. Paunescu, P. Kalmutchi (1991), Numerical simulation of mathematical model for an autopilot electrohydraulic servo (in Romanian), *Studii si cercetari de mecanica aplicata,* **50**, 3-4, 273-283.

1. Duca, M., I. Ursu, V. Dragan, N. Tepes (1977), Analysis of fluid flow equation in a four-way valve of hydraulic servoactuator (in Romanian), *Constructia de masini*, **29**, 12, 630-633.

Conferences, Conferences Proceedings and Books of Abstracts

148. D. Enciu, A. Halanay, C.- A. Safta, A. Toader, I. Ursu, Control synthesis and stability analysis of equilibria in a mathematical model of a pneumatic servosystem, ICNPAA 2023 – ICNPAA: Mathematical Problems in Engineering, Aerospace and Sciences. D, 27-30 June 2023, online
147. I. Ursu, A. Toader, G. Tecuceanu, D. Enciu, Input-to-state stability of a time-invariant system with control delay and additive disturbances, GAMM 2023 – 93rd Gesellschaft für angewandte Mathematik und Mechanik, May 30 – June 02 2023, Dresden, Germany
146. D. Enciu, A. Halanay, I. Ursu, On the critical stability of a nonlinear switched system with state delay, AMMS 2023 - 5th International Applied Mathematics, Modelling and Simulation Conference, 14-16 July 2023, Leipzig, Germany
145. D. Enciu, I.Ursu, Further results on the input-to-state stability of a linear system with control delay, ICPAM 2023 – 12th International Conference on Pure and Applied Mathematics, 18-21 July 2023, Porto, Portugal
144. C. Stoica, I. Ursu, D. Enciu, M. A. Panait, A model for turbulent flow energy dissipation - practical aspects of turbulent flow investigations, The 40th "Caius Iacob" Conference on Fluid Mechanics and its Technical Applications 2023, 19-20 October 2023, Bucharest, Romania
143. A. Toader, D. Enciu, I. Ursu, The stability of a linear time-invariant system with control delay. Application to the stability of the aircraft control chain in conditions of atmospheric turbulence, ICINCO 2023, 20th International Conference on Informatics in Control, Automation and Robotics, 13-15 November 2023, Rome, Italy
142. D. Enciu, I. Ursu, Towards improving passangers safety and comfort based on turbulence test in aerodynamic tunnel, The 8th Conference of the Sustainable Solutions for Energy and Environment (EENVIRO 2022), 16-20 October, UTCB, Bucharest, Romania
141. D. Enciu, I. Ursu, G. Tecuceanu, On the evaluation of turbulence parameters in the Wind Tunnel, International Conference of Aerospace Sciences „AEROSPATIAL 2022", 13-14 October 2022, INCAS, Bucharest, Romania

140. D. Enciu, A. Halanay, I. Ursu, A critical case for stability in a model of an electrohydraulic servomechanism, 29th Conference On Applied And Industrial Mathematics (CAIM 2022), 25-28 August 2022, Chisinau, Republic of Moldova
139. D. Enciu, A. Halanay, I. Ursu, Critical case of stability for a nonlinear switched system of delay differential equations with applications to a hydraulic servomechanism, 11th International Conference on Pure and Applied Mathematics (ICPAM 2022), 20-22 July 2022, Bratislava, Slovakia
138. D. Enciu, I. Ursu, G. Tecuceanu, New strategy for the safety and comfort of the passengers and aircraft crew during atmospheric turbulence, 7th European Conference on Structural Control (EACS 2022), 10-13 July 2022, Warsaw, Poland
137. L. Tirle, I. Ursu, D. Enciu, Damage Identification and Localization in an Aluminium Plate Based on Lamb Waves, 4th edition of the Space Launching Systems and the 16th edition of the International Conference on Design, Modeling and Optimization (SLS & OPTIROB 2021), 1-5 July 2021, Jupiter, Constanta, Romania
136. I. Ursu, A. Toader, D. Enciu, G. Tecuceanu, Equilibrium stability of a wing model with delay on switching control, International Conference of Aerospace Sciences „AEROSPATIAL 2020", 15-16 October 2020, INCAS, Bucharest, Romania
135. A. Dogeanu, I. Nastase, I. Ursu, D. Enciu, F. Bode, M. Sandu, C. Croitoru, S. Zaharia, G. Iana, Real time monitoring network demonstrator for air quality management, 2019 International Conference on Energy and Environment (CIEM), 17 – 18 October 2019, Timisoara, Romania
134. D. Enciu, A. Halanay, A. A. Radu, M. Stoia-Djeska, G. Tecuceanu, I. Ursu, Equilibrium stability of a 2-D wing with time delayed feedback control, International Conference of Aerospace Sciences „AEROSPATIAL 2018", 25-26 October 2018, INCAS, Bucharest, Romania
133. I. Ursu, D. D. Ion Guta, D. Enciu, G. Tecuceanu, A. A. Radu, Flight envelope expansion based on active mitigation of flutter via a V-stack piezoelectric actuator, Modern Practice in Stress and Vibration Analysis (MPSVA 2018), 2 - 4 July 2018, Cambridge, UK
132. M. Tudose, D. Enciu, I. Ursu, Towards use of fiber Bragg grating sensors for structural health monitoring of (aero)space structures, 1st edition of the Space Launching Systems and the 13th edition of the International Conference on Design, Modeling and Optimization (SLS & OPTIROB 2018), 28 June - 2 July 2018, Jupiter, Constanta, Romania
131. D. Enciu, I. Ursu, G. Tecuceanu, A problem of stabilization for the mathematical model of electrohydraulic servomechanism with control delay, 42nd ARA Congress (American Romanian Academy of Arts and Sciences), 23-26 May 2018, Cluj-Napoca, Bucharest
130. D. Enciu, G. Tecuceanu, I. Ursu, Mathematical model of electrohydraulic servomechanism with control delay. Numerical simulations, 6th International Workshop on Numerical Modelling in Aerospace Sciences (NMAS 2018), 16 – 17 May 2018, INCAS, Bucharest, Romania
129. D. Enciu, I. Ursu, M. Tudose, Complex method for online identification of mechanical damages using the electromechanical impedance spectroscopy, avoiding the false diagnosis – patent presentation, 46th International Inventions Salon, 11-15 April 2018, Geneve, Switzerland
128. D. Enciu, I. Ursu, G. Tecuceanu, Dealing with input delay and switching in electrohydraulic servomechanism mathematical model, 5th International Conference on Control, Decision and Information Technologies (CoDIT 2018), 10-13 April 2018, Thessaloniki, Greece
127. I. Nastase, I. Ursu, D. Enciu, V. Iordache, S. Zaharia, M. Gustiuc, C. Croitoru, Real Time Monitoring Network System for Urban Air Quality Management, 4th International Conference on Building Energy, Environment (COBEE 2018), 5-9 February 2018, Melbourne, Australia
126. D. Enciu, A. Halanay, G. Tecuceanu, I. Ursu, A predictive type approach of control delay for electrohydraulic servomechanism, The 37th "Caius Iacob" Conference on Fluid Mechanics and its Technical Applications, 16-17 November 2017, INCAS, Bucharest, Romania
125. D. Enciu, I. Ursu, M. Tudose, Complex method for online identification of mechanical damages using the electromechanical impedance spectroscopy, avoiding the false diagnosis – patent presentation, The Romanian Research Salon "Made in Romania" (Salonul Cercetarii Romanesti "Conceput in Romania"), 25-27 October 2017, Bucharest, Romania (+ poster)
124. D. Enciu, I. Ursu, D. D. Ion Guta, G. Tecuceanu, A. G. Persinaru, I. Popescu, A. A. Cubillo, Antiflutter Demonstrator with Piezoelectric Actuation, The Romanian Research Salon "Made in Romania" (Salonul Cercetarii Romanesti "Conceput in Romania"), 25-27 October 2017, Bucharest, Romania (+ poster)
123. D. D. Ion Guta, I. Ursu, G. Tecuceanu, D. Enciu, System and method for flight envelope expansion via piezoelectric actuation, CEAS 2017, 16-20 Oct. 2017, Sala Parlamentului Romaniei
122. Dragos Daniel Ion Guta, Ioan Ursu, George Tecuceanu, Alexandru Persinaru, Daniela Enciu, A V-stack piezoelectric actuator for active mitigation of flutter – design and laboratory tests, NMAS 2017
121. Daniela Enciu, Ioan Ursu, Mihai Tudose, Structural Health Monitoring for (Aero)Space Applications, ESA, 28-30 march 2017
120. Ilinca Nastase, Cristiana Croitoru, Mircea Dan, Ioan Ursu, Amina Meslem, Experimental study for the integration of an innovative air distribution system in operating rooms EENVIRO 2016 26-28 October Bucharest

119. Mircea Dan, Ioan Ursu, Advanced thermal manikin with neuro-fuzzy control EENVIRO 2016 26-28 October Bucharest
118. D. Enciu, I. Ursu, M. Tudose, *Towards Space applications of SHM technology relied on EMIS method*, 8th European Workshop on Structural Health Monitoring – EWSHM 2016, 5 – 8 July 2016, Bilbao, Spain (+ poster)
116. D. Enciu, I. Ursu, M. Tudose, *Towards Space applications of SHM technology relied on EMIS method*, Proc. of EWSHM 2016, vol. 21, no. 8, ISSN 1435-4934, 2016
115. D. Enciu, I. Ursu, *Tests on Piezoelectric Materials Qualification on Structural Health Monitoring of Space Vehicles*, International Conference on Advances in functional Materials – AFM 2016, 8 – 11 August 2016, Jeju, South Korea (+ poster)
114. D. Enciu, A. Toader, I. Ursu, M. Tudose, *Structural Health Monitoring Validation for Space Vehicles*, International Astronautical Congress – IAC, 12 – 16 October 2015, Jerusalem, Israel
113. D. Enciu, A. Toader, M. Tudose, I. Ursu, *A thorough analysis of damages in Space SHM*, 3rd International Workshop on Numerical Modelling in Aerospace Sciences, „NMAS 2015", 6-7 May 2015, INCAS, Bucharest, Romania
112. D. Enciu, I. Ursu, A. Toader, M. Tudose, *Online damage identification and offline damage metrics evaluation in SHM*, International Conference on Advances in Vibrations, „VIBRATIONS 2015", 30 March – 01 April 2015, Faculdade de Engenharia da Universidade do Porto, Porto, Portugal
111. I. Ursu, A. Toader, D. Enciu, D. M. Stefanescu, *Advanced measurements in star space project on structural health monitoring*, XXI IMEKO World Congress "Measurement in Research and Industry", August 30 – September 4, 2015, Prague, Czech Republic (+ poster)
110. D. Enciu, M. Tudose, B. Neculaescu, A. Toader, I. Ursu, *Damage identification and damage metrics in SHM* , International Conference of Aerospace Sciences „AEROSPATIAL 2014", 18-19 September 2014, INCAS, Bucharest, Romania
109. D. Enciu, G. A. Nemnes, I. Ursu, *Spin filtering effects in graphene nanoribbons doped with Mn impurities*, Annual Scientific Session, Faculty of Physics, 20 June 2014, Magurele, Ilfov, Romania
108. D. Enciu, A. Toader, I. Ursu, Magnetic field nanosensor based on Mn impurities, 2nd International Workshop on Numerical Modelling in Aerospace Sciences, „NMAS 2014", 7-8 May 2014, INCAS, Bucharest, Romania
107. D. Enciu, M. Tudose, B. Neculaescu, A. Toader, I. Ursu, Damage identification and damage metrics in SHM (structural health monitoring), AEROSPATIAL 2014, 18-19 september 2014, Bucharest, Romania, Proc. of AEROSPATIAL 201, in curs de aparitie.
106. C. Rugina, V. Giurgiutiu, A. Toader, I. Ursu, Finite element analysis of the electromechanical impedance method on aluminum plates in SHM, AEROSPATIAL 2014, 18-19 September 2014, Bucharest, Romania Proc. of AEROSPATIAL 201, in curs de aparitie.
105. Rugina C, Giurgiutiu V., Toader A., Ursu I., The electromechanical impedance method on thin plates (a se vedea http://www.imsar.ro/Sisom_2014.pdf)
104. D. Enciu, M. Tudose, B. Neculaescu, A. Toader, I. Ursu, *Damage identification and damage metrics in SHM (structural health monitoring)*, Proc. of AEROSPATIAL 2014, pp. 349-364, ISSN 2067-8614, 2014
103. I. Ursu, I. Nastase, A. Toader, Eficienţă energetică şi confort în clădiri: sisteme de aer condiţionat bazate pe inteligenţa artificială, Echilibru între eficienţa energetică, calitate ambientală şi confort în clădiri şi alte spaţii ocupate. Soluţii şi provocări actuale, 18 November 2014, Academia Romana, Bucharest.
102 A. Iftene, S. Caluianu, I. Nastase, I. Ursu, G. Tecuceanu, A. Toader, Synthesis and simulation of neuro-fuzzy HVAC systems, The 35th "Caius Iacob" Conference on Fluid Mechanics and itsTehnical Applications 2013, November 14-15, Bucharest, ROMANIA.
101. I. Ursu, I. Nastase, S. Caluianu, A. Iftene, A. Toader, About the synthesis and simulation of intelligent HVAC systems, The 5th "Romanian Conference on Energy Performance of Buildings" (RCEPB-V), 29-30th of May, 2013, Bucharest, ROMANIA.
100. I. Ursu, M. Arghir, C. Valeanu, G. Tecuceanu, A. Toader, M. Tudose, Mechatronic test bench for wing flight controls, AEROSPATIAL 2012. Proceedings of the International Conference of Aerospace Sciences "AEROSPATIAL 2012" 11 - 12 October, 2012, Bucharest, Romania, pp. 229-235.
99. Ursu, I., A. Toader, Neuro-fuzzyadaptive control synthesis for autonomous flight control of an unmanned air vehicle, *CAIM 2011, 19th Conference on Applied and Industrial Mathematics*, September 22nd-25th 2011, Iasi, Romania, Book of Abstracts, p. 51.
98. Ursu, I., L. Iorga, A. Toader**,** G. Tecuceanu, Active Robust Control of a Smart Plate, *ICINCO 2011 8th International Conference on Informatics in Control, Automation and Robotics*, Noordwijkerhout, The Netherlands, 28-31 July 2011.
97. Balea, S., A. Halanay, I. Ursu, New results on the problem of the stabilization of equilibria for models of electrohydraulic servoactuators Proceedings of 10éme Colloque Franco-Roumain de Mathématiques Appliquées, 26-31 Août 2010, Poitiers, published in AIMS Journal Discrete and Continuous Dynamical Systems – series B.

96. Toader, A., I. Ursu, Towards a PIO II criterion: Improving the pilot modeling, *Proceedings of CSCS-18, 18th Intern. Conference on Control Systems and Computer Science*, May, 24-27 2011, Politehnica University of Bucharest, pp. 366-371, Editura Politehnica University.
95. Ursu, I., An integrated methodology of control synthesis with anti-windup feedback compensation, *Proceedings of CSCS18, 18th Intern. Conference on Control Systems and Computer Science*, 24-27 May 2011, Politehnica University of Bucharest, pp. 355-359, Editura Politehnica University.
94. Ursu, I., L. Iorga, G. Tecuceanu, A. Toader, V. Berar, F. Ursu, Methodologies for robust control of piezoelectric smart structures. Theoretical and experimental results, *Proceedings of the International Conference of Aerospave Sciences "AEROSPATIAL 2010",* October 20 - 21, 2010, Bucharest, Romania, ISSN 2067-8616, pp. 471-486.
93. Toader, A., I. Ursu, From limits of human pilot mathematical modeling to actuator rate limits. A PIO II tendencies case study, *Mathematical Methods in Engineering, International Symposium-MME10*, Instituto Politecnico de Coimbra, Portugal, 21-24 October, 2010, CD published.
92. Balea, S., A. Halanay, I. Ursu, Coordinate transformations and stabilization of switched control systems with application to hydrostatic electrohydraulic servoactuators, *10éme Colloque Franco-Roumain de Mathématiques Appliquées*, 26-31 Août 2010, Poitiers, France, http://www-math.univ-poitiers.fr/CFR2010/
91. Halanay, A., I. Ursu, C. A. Safta (2009), Stability Analysis for a Nonlinear Model of a Hydrostatic Electrohydraulic Actuator, *The XXXIInd Caius Iacob Conference on Fluid Mechanics and its Technical Applications*, Bucuresti, 16-17 octombrie, Book of Abstracts, p. 20.
90. Halanay, A., I. Ursu, C. A. Safta, F. Ursu (2009), Control synthesis for electrohydraulic servoactuators in a servoelastic framework, *7th International Conference on Mathematical Problems in Engineering and Aerospace Sciences* (June 25-27, 2008, Genoa, Italy), pp. 716-723, Cambridge Scientific Publishers, ISBN 987-1-904868-70-5, Ed. Siva Sundaram.
89. Halanay, A., and I. Ursu (2009), Stabilization of equilibria in switching models for electrohydraulic servoactuators in a servoelastic framework, *7th International Conference on Mathematical Problems in Engineering and Aerospace Sciences* (June 25-27, 2008, Genoa, Italy), pp. 73-80, Cambridge Scientific Publishers, ISBN 987-1-904868-70-5, Ed. Siva Sundaram.
88. Balea, S., A. Halanay, F. Ursu, I. Ursu (2009), Geometric methods in control synthesis for electrohydraulic servoactuators in servoelastic framework, *7th International Conference on Mathematical Problems in Engineering and Aerospace Sciences* (June 25-27, 2008, Genoa, Italy), pp. 51-57, Cambridge Scientific Publishers, ISBN 987-1-904868-70-5, Ed. Siva Sundaram.
87. Toader, A., L. Iorga, I. Ursu, Robust aeroservoelastic control of high-aspect ratio wings, *ICNPAA 2008: Mathematical Problems in Engineering, Aerospace and Sciences***,** June 25-27, 2008, Genoa, Italy.
86. Ursu, F., I. Ursu, New developments in fuzzy logic control synthesis for airplane antilock braking system, *ICNPAA 2008: Mathematical Problems in Engineering, Aerospace and Sciences***,** June 25-27, 2008, Genoa, Italy.
85. Alecu, A., E. Munteanu, T. Sireteanu, I. Ursu (2008), O noua abordare pentru testarea experimentala si sinteza legii de control a modelelor de izolare antivibratorie de tip suspensie activa, *Conferinta Internationala de Stiinte Aerospatiale "AEROSPATIAL 2008"*, pp. 190-199, ISBN 978-973-0-05704-1**.**
84. Ursu, I, F. Ursu (2008), Using future information, both real and virtual, in the synthesis of control law, *Conferinta Internationala de Stiinte Aerospatiale "AEROSPATIAL 2008"*, pp. 269-272, Bucuresti, 1-2 octombrie, ISBN 978-973-0-05704-1**.**
83. Ursu I. and E. Munteanu (2008), Piezo smart composite wing with sliding mode control, *Proceedings of CONTROLO 2008 Conference*, CD publised ISBN 978-972-669-877-7, 2008, pp.166-171.
82. Munteanu, E., I. Ursu and C. Rugina (2008), Design of Active Control Laws for Implementing Structural Health Monitoring, 10th WSEAS International Conference on Mathematical and Computational Methods in Science and Engineering (MACMESE' 08), Bucharest, Romania, November 7-9, 2008 (published in „*Proceedings –Recent Advances in Mathematical and Computational Methods in Science and Engineering* – Part II, pp. 340-345").
81. Munteanu, E., I. Ursu and A. Alecu (2008), Piezo smart wing with sliding mode control, *International Journal of Computers, Communication and Control*, **3**, pp. 417-421, Supplissue: Proceedings of ICCC 2008, Baile Felix, Oradea, May 15-17.
80. Munteanu, E., I. Ursu (2008), Active control techniques for piezo smart composite wing (2008), *Proceedings of the 9th WSEAS International Conference on AUTOMATION and INFORMATION (ICAI'08)*, pp. 554-559 (ISI indexed).
79. Munteanu, E., I. Ursu (2008), Design of robust active control for flutter alleviation, the 19th INTERNATIONAL DAAAM SYMPOSIUM „Intelligent Manufacturing & Automation: Focus on Next Generation of Intelligent Systems and Solutions", 22-25th October 2008, (ISI indexed).
78. Munteanu, E. and I. Ursu, (2007), Piezo smart composite wing with LQG control, *Proceedings of 2nd International Conference Computational Mechanics and Virtual Engineering – COMEC 2007*, Brasov, October 11-13, Romania, pp. 305-311.

77. Munteanu, E. and I. Ursu, (2007), Robust LQG/LTR Control Synthesis for Flutter Alleviation, *Proceedings of the International Conference on Teory and Applications of Mathematics and Informatics*, ICTAMI 2007, Alba Iulia, Romania.
76. Toader, A., I. Ursu (2007), Backstepping control synthesis for hydrostatic type flight controls electrohydraulic actuators, *The International Symposium on System Theory, Automation, Robotics, Computers, Informatics, Electronics and Instrumentation*, 18-20 October 2007 Craiova, Romania.
75. Halanay, A., C. A. Safta, F. Ursu, I. Ursu (2007), Stability analysis and tracking control of a hydraulic servo in a servoelastic framework: backstepping design, *6th International Conference on Mathematical Problems in Engineering and Aerospace Sciences*, Cambridge Scientific Publishers, Ed. Siva Sundaram, pp. 839-846.
74. Ursu, F., I. Ursu, E. Munteanu (2007), Adaptive backstepping type control for electrohydraulic servos, *Proceedings of 15th IEEE Mediterranean Conference on Control and Automation - MED07*, Athens, June 27-30, CD published.
73. Ursu, I., F. Ursu, A. Halanay, S. Balea (2007), Geometric control in a regulator problem for electrohydraulic servos, *Proceedings of the 15th IEEE Mediterranean Conference on Control and Automation - MED07*, Athens, June 27-30, CD published.
72. Ursu, I., G. Tecuceanu, F. Ursu, A. Toader (2007), Nonlinear control synthesis for hydrostatic type flight controls electrohydraulic actuators, *Proceedings of the International Conference in Aerospace Actuation Systems and Components*, Toulouse, June 13-15, pp. 189-194.
71. Iorga, L., E. Munteanu, I. Ursu (2007), Enhancing wing dynamic behavior by using piezo patches, *Proceedinds of International Conference in Aerospace Actuation Systems and Components*, Toulouse, June 13-15, pp. 171-176.
70. Ursu, I., F. Ursu (2006), New results in seismic isolation semiactive control of buildings using magnetorheological dampers, *A 31-a Conferinţă naţională "Caius Iacob" de mecanica fluidelor, modelare matematică, sisteme dinamice neliniare şi aplicaţii în tehnică*", Braşov, 19 – 21 octombrie 2006, Published in Bulletin of the Transilvania University of Brasdov, Series B. Supplemetal Issue, tom 13 (48), pp. 179-189.
69. Ursu, I., G. Tecuceanu, F. Ursu (2006), Neuro-fuzzy control synthesis for electrohydraulic servos actuating primary flight controls, *25th ICAS Congress, Hamburg, Germany*, 3-8 September 2006, CD published.
68. Ursu, I., F. Ursu (2006), Fonctions Liapunov de contrôle pour la synthèse du servomécanisme électrohydraulique", *8ième Colloque franco-roumain de Mathèmatiques Appliquées, Chambery*, 28 aout-1er septembre 2006.
67. Halanay, A., C. A. Safta, F. Ursu, I. Ursu (2006), La synthèse de la servocommande hydraulique: un noveau point de vue", *8ième Colloque franco-roumain de Mathèmatiques Appliquées*, Chambery, 28 aout-1er septembre 2006.
66. Halanay, A., C. A. Safta, F. Ursu, I. Ursu (2006), Stability analysis of equilibria in nonlinear models for mecano-hydraulic servomechanisms, *Marrakesh World Conference on Differential Equations and Applications, Marrakesh*, June 15-20 2006.
65. Balea, S., A. Halanay, C. A. Safta, F. Ursu, I. Ursu (2006), Geometric methods in nonlinear control synthesis for electro-hydraulic servoactuators, *6eme Conference Internationale AIMS "Systemes Dynamiques, Equations Différentielles et Applications*", Université de Poitiers Poitiers, France, 25-28 juin 2006. Organisateurs: Université de Poitiers et American Institute of Mathematical Sciences (AIMS).
64. Ursu, I., F. Ursu, L. Iorga, H. Baruh (2006), $H_{infinity}$ control with μ analysis of a piezoelectric actuated plate", *ICNPAA 2006, Mathematical Problems in Engineering and Aerospace Sciences*, June 21-23, Budapest, Hungary.
63. Halanay, A., C. A. Safta, F. Ursu, I. Ursu (2006), Stability analysis and tracking control synthesis of a hydraulic servo in a servoelastic framework, *ICNPAA 2006, Mathematical Problems in Engineering and Aerospace Sciences*, June 21-23, Budapest, Hungary.
62. Ursu, I., F. Ursu, G. Tecuceanu and R. Cristea (2006), Fuzzy supervised neurocontrol of electrohydraulic servos, *GAMM 2006, Gesellschaft für Angewandte Mathematik und Mechanik e.V. 77th Annual Scientific Conference*, Berlin, March, 27 – 31, Technische Universität Berlin, Book of Abstracts, p. 521. / **DOI** 10.1002/pamm.200610405.
61. Ursu, F., I. Ursu, L. Iorga (2006), New developments in robust synthesis with antiwindup compensation. Flight control actuators applications, *GAMM 2006, Gesellschaft für Angewandte Mathematik und Mechanik e.V. 77th Annual Scientific Conference*, Berlin, March, 27 – 31, Technische Universität Berlin, Book of Abstracts, p. 514.
60. Ursu, I., F. Ursu, F. Popescu (2005), New results in backstepping design. Electrohydraulic servos applications, *Conferinta AEROSPATIAL 2005*, Bucuresti, 11-12 October, INCAS Elie Carafoli, CD-ROM published.
59. Cristea, R., G. Tecuceanu, F. Ursu, I. Ursu (2005), Neuro-fuzzy synthesis of electrohydraulic servo for motion control. Experimental validation, Conferinta AEROSPATIAL 2005, Bucuresti, 11-12 October, INCAS Elie Carafoli, CD-ROM published.
58. Ursu, I., F. Ursu (2005), New results in backstepping design for electrohydraulic servos: adaptive control synthesis, *Proceedings of the SINTES 12 – The International Symposium on Systems Theory, Automation, Robotics, Computers, Informatics, Electronics and Instrumentation*, October 20-22, 2005, University of Craiova, Romanian Academy of Engineering Sciences, University of Craiova and IEEE – Romanian Section, vol. 1, pp. 219-224.
57. Ursu, I., G. Tecuceanu, F. Ursu, R. Cristea (2005), Neuro-fuzzy control is better than crisp control, ICTAMI 2005, – I*nternational Conference on Theory and Applications of Mathematics and Informatics*, September, 15-17, 2005, Alba

Iulia, "1 Decembrie 1918" University of Alba Iulia, The Mathematical Institute of the Romanian Academy and Alexander the Great Technological Institute of Thessalonik, Program, p. 82.
56. Ursu, F., I. Ursu, N. Apostolescu (2005), Fuzzy logic control of an antilock-braking system for a road vehicle, *Second International Conference of Applied Mathematics*, Plovdiv, Technical University, August 12-17, Book of Abstracts, p. 297, Eds. Drumi Bainov and Svetoslav Nenov.
55. Ursu, I., F. Ursu (2005), Adaptive backstepping based tracking control related to flight control actuators synthesis, *Second International Conference of Applied Mathematics*, Plovdiv, Technical University, August 12-17, Book of Abstracts, p. 296, Eds. Drumi Bainov and Svetoslav Nenov.
54. Iorga, L., H. Baruh, I. Ursu (2005), Refined analysis of the piezoelectric pseudoactive control for helicopter blades vibration", 46th *AIAA/ASME/ASCE/AHS/ASC Structures, Structural Dynamics and Materials Conference*, April 18-21, Hyatt Regency Austin, Austin, Texas, USA.
53. Ursu, F., I. Ursu (2005), An extended Popov-Morozan frequency domain criterion for absolute stability, *GAMM* 2005, *Gesellschaft für Angewandte Mathematik und Mechanik e.V.* 76th *Annual Scientific Conference*, Luxembourg, March 28 – April 01, Université de Louxembourg, Book of Abstracts, p. 77.
52. Ursu, I., F. Ursu (2005), Backstepping design of adaptive control: flight control actuators application, *GAMM* 2005, *Gesellschaft für Angewandte Mathematik und Mechanik e.V.* 76th *Annual Scientific Conference*, Luxembourg, March 28 – April 01, Université de Louxembourg, Book of Abstracts, p. 78.
51. Ursu, I., F. Ursu (2004), About pseudoactive control of hydraulic servo self-excited oscillations, *Proceedings of the International Conference on Recent Advances in Aerospace Actuation Systems and Components***,** pp. 173-182, November 24-26, 2004, Toulouse, France.
50. Ursu, I., F. Ursu (2004), Some absolute stability restrictions in output feedback synthesis of electrohydraulic servos, *Proceedings of the International Conference on Recent Advances in Aerospace Actuation Systems and Components***,** pp. 173-182, November 24-26, 2004, Toulouse, France.
49. Ursu, I., F. Ursu (2004), New results in robust synthesis with antiwindup compensation. Flight control actuators applications, *Proceedings of the ICNPAA* 2004, *International Conference on Nonlinear Problems in Aviation and Aerospac***,** *Mathematical Problems in Engineering and Aerospace Sciences*, June 2-4, The West University of Timisoara, Timişoara, Romania, pp. 647-656, © Cambridge Scientific Publishers, ISBN 1-904868-48-7.
48. Halanay, A., F. Popescu, C. A. Safta, F. Ursu, I. Ursu (2004), Stability analysis and non-linear control synthesis for hydraulic servos actuating primary flight controls, *Proceedings of the ICNPAA* 2004, *International Conference on Nonlinear Problems in Aviation and Aerospace, Mathematical Problems in Engineering and Aerospace Sciences*, June 2-4, The West University of Timisoara, Timişoara, Romania, pp**.** 243-250, © Cambridge Scientific Publishers**,** ISBN 1-904868-48-7
47. Iorga, L., H. Baruh, I. Ursu (2004), Pseudoactive control of helicopter blade vibration using piezoelectric actuators, 45th *AIAA/ASME/ASCE/AHS/ASC Structures, Structural Dynamics and Materials Conference*, April 19-22 , Palm Springs, California, USA.
46. Ursu, F., I. Ursu (2004), Developments of Mauer's fuzzy logic ABS paradigm. Aircraft application, *GAMM* 2004, *Gesellschaft für Angewandte Mathematik und Mechanik e.V*. 75th *Annual Scientific C*onference, Dresden, March 21-27, Technische Universität Dresden, Book of Abstracts, pp. 49.
45. Ursu, I., F. Ursu, F. Popescu (2004), Control Lyapunov function synthesis based on Barbalat's lemma. Servo synthesis application, *GAMM* 2004*, Gesellschaft für Angewandte Mathematik und Mechanik e.V.* 75th *Annual Scientific Conference*, Dresden, March 21-27, Technische Universität Dresden, Book of Abstracts, pp. 50.
44. Ursu, I., F. Ursu (2003), An intelligent ABS control based on fuzzy logic. Aircraft application", *Proceedings of ICTAMI* 2003, *International Conference on Theory and Applications of Mathematics and Informatics*, Alba Iulia, Romania, October 24-25, pp. 355-368.
43. Stoia-Djeska, M., I. Ursu, F. Ursu (2003), Flutter suppression by active control. A typical problem, *Proceedings of The International Symposium on Systems Theory, SINTES* 11, XIth Edition, Vol. 1 *Automation. Mechatronics Systems*, Craiova, Romania, October 23-24, pp. 127-132.
42. Ursu, I. (2003), Antisaturating synthesis methodologies for aerospace systems, Official Programme of AEROSPATIAL 2003, PHASE AND PERSPECTIVES, Annual Session of National Aeronautics and Space Programme of Ministry of Education and Research, Bucharest, July 3-4, p. 4.
41. Ursu, I., F. Popescu, F. Ursu (2003), Control synthesis for electrohydraulic servo mathematical model, *Proceedings of the CAIM* 2003, *the* 11*th International Conference on Applied and Industrial Mathematics*, May 29-31, Oradea, Romania.
40. Ursu, I., F. Ursu (2003), Robust control synthesis in flying trajectory tracking problem, *Proceedings of the CAIM* 2003, *the* 11*th International Conference on Applied and Industrial Mathematics*, , May 29-31, Oradea, Romania.
39. Halanay, A., C. Safta, I. Ursu, F. Ursu (2002), A four dimensional model for mechano-hydraulic servosystems and stability equilibrium points, 6*ème Colloque Franco-Roumain de Mathématiques Appliquées*, Perpignan, France, 2-6 Septembre.
38. Ursu, I., F. Ursu, A. Plaian (2002), Fuzzy logic mathematical model for an ABS system. Application for the airplane IAR 99 (in Romanian), *Buletin Stiintific al Sesiunii Nationale de Comunicari Stiintifice a Academiei Fortelor Aeriene "Henri*

Coanda" si a Centrului Regional pentru Managementul Resurselor de Aparare, Brasov, Romania, November 1-2, tom III, No. 2(14), pp. 55-64.
37. Ursu, I., F. Ursu (2002), Fuzzy ABS algorithm synthesis for airplane IAR 99, *Book of Abstracts of the CAIM* 2002, *the* 10*th International Conference on Applied and Industrial*, Pitesti, Romania, October 11-13, p. 15.
36. Ursu, I., F. Popescu (2002), Backstepping control synthesis for position and force nonlinear hydraulic servoactuators, *Book of Abstracts of the CAIM* 2002, 10*th International Conference on Applied and Industrial Mathematics*, Pitesti, Romania, October 11-13, p. 16.
35. Ursu, I., F. Ursu (2002), Pseudoactive control of hydraulic servo self-excited oscillations, *Proceedings of the 27th ARA (American-Romanian Academy) Congress*, Oradea, Romania, May 23-25.
34. Ursu, I., F. Ursu (2001), Optimal antisaturating control synthesis by direct and indirect methods, *Annual National Conference "Caius Iacob" of Fluid Mathematics and Technical Applications*, Institute of Applied Mathematics "Caius Iacob" of Romanian Academy and Department of Mechanics and Equations, University of Bucharest, Faculty of Mathematics.
33. Ursu, F., I. Ursu (2001), A switching type neuro-fuzzy control synthesis, *Annual National Conference "Caius Iacob" of Fluid Mathematics and Technical Applications*, Institute of Applied Mathematics "Caius Iacob" of Romanian Academy and Department of Mechanics and Equations, University of Bucharest, Faculty of Mathematics, October 5-6.
32. Ursu, I., F. Ursu (2001), Artificial intelligence control synthesis versus conventional control synthesis. Flight controls servo applications, *Proceedings of the Aerospace International Symposium "Carafoli* 2001*"* (dedicated to the Centenary of Elie Carafoli), Bucharest, October 19-20, pp. 163-168.
31. Iorga, L., I. Ursu, F. Ursu (2001)**,** LQG vibration control for plate structures using piezoceramic tranducers", *Preprints of 15th IFAC* (*International Federation of Automatic Control*) *Symposioum on Automatic Control in Aerospace*, September 2-7, Bologna/Forli, Italy, pp. 518-523.
30. Ursu, F., I. Ursu, M. Vladimirescu (2001), Robust synthesis with antiwindup compensation for electrohydraulic servo actuating primary flight controls, *Proceedings of the* 15*th IFAC* (*International Federation of Automatic Control*) *Symposium on Automatic Control in Aerospace*, Bologna/Forli, Italy, September, 2-7, pp. 197-202.
29. Sireteanu, T., C. W. Stammers, M. Giuclea, I. Ursu, E. Gugliemino (2000), Semiactive suspension with fuzzy controller optimized by genetic algorithm, *ISMA* 25, *International Conference on Noise and Vibration Engineering*, Katholieke Universiteit Leuven, Belgium, September 13-15, CD published.
28. Iorga, L., F. Ursu, I. Ursu (2000), Optimal vibration control of bending plates using piezoceramic materials, *Les travaux du* 5*ème Colloque Franco-Roumain des Mathématiques Appliquées*, Constanta, Romania, August 28 - September 01, pp. 53-56.
27. Ursu, F., I. Ursu (2000), Active and semiactive neurocontrollers for suspension systems, *Les travaux du 5eme Colloque Franco-Roumain des Mathématiques Appliquées*, Constanta, Romania, August 28 - September 01, p. 41.
26. Sireteanu, T., I. Ursu, S. Bellizzi (1999), A parametric criterion for equivalent linearization of strongly nonlinear systems, *Proceedings of the* 23*rd National Conference on Solid Mechanics*, Ploiesti, *Buletinul Universitatii "Petrol-Gaze*", Ploiesti, Vol. **LI**, No. 1, pp. 79-84.
25. Plaian, A., I. Ursu (1999), Position control system for the NOTTE Experiment, *Proceedings of ICALEPCS 99, International Conference on Accelerator and Large Exp, erimental Physics Control Systems,* Trieste, Italy, October 4-8, CD published.
24. Ursu, I., A. Plaian, F. Ursu (1999), Positioning Algorithms in the NOTTE Experiment, *Proceedings of ICALEPCS 99, International Conference on Accelerator and Large Experimental Physics Control Systems,* Trieste, Italy, October 4-8, CD published. http://cdsweb.cern.ch/record/532773/files/wc1o04.pdf
23. Ursu, I., F. Ursu, T. Sireteanu (1999), About absolute stable synthesis of electrohydraulic servo, *Technical Papers of AIAA (AIAA-99-4090) Guidance, Navigation and Control Conference,* Portland, Oregon, USA, August 9-11, Vol. **2**, pp. 848-858.
22. Bellizzi, S., T. Sireteanu., I. Ursu (1999), A new Gaussian equivalent linearization approach to strongly nonlinear systems, 13*th ASCE Engineering Mechanics Conference*, The Johns Hopkins University, Baltimore MD, USA, June 19-16, CD published.
21. Ursu, F., I. Ursu, (1999), About the training of perceptrons in active and semiactive control of suspension systems, *Book of Abstracts of GAMM Annual Meeting*, Metz, France, April 12-16, p. 157.
20. Ursu, I., F. Ursu, T. Sireteanu (1999), Semiactive suspension systems with antichattering logic and tradeoff between comfort and safety, *Book of Abstracts of GAMM Annual Meeting*, Metz, France, April 12-16, p. 157.
19. Ursu, I., T. Sireteanu (1998), A new learning controlled sequential semiactive suspension system, *Proceedings of* 1998 *FISITA World Automotive Congress*, Paris, September 27 - October 1, CD published.
18. Ursu, F., T. Sireteanu, I. Ursu (1998), On anti-chattering synthesis for active and semi-active suspension systems, *Preprints of the 3rd IFAC International Workshop on Motion Control*, Grenoble, France, September 21-23, pp. 93-98, © IFAC.

17. Sireteanu, T., S. Bellizzi, I. Ursu (1998), An extension of Gaussian equivalent linearization, *Abstracts of ICM 1998, International Congress of Mathematicians*, Berlin, August 18-27, p. 270.
16. Tecuceanu, G., C. Popeea, I. Ursu (1998), A game type approach of an active suspension system suspension, *Book of Abstracts of Annual Meeting of GAMM* (*Gesellschaft fu r Angewandte Mathematik und Mechanik*), Bremen, Germany, April 6-9, p. 138.
15. Sireteanu, T., S. Bellizzi, I. Ursu (1997), An extension of Gaussian equivalent linearization for Duffing oscillators, *Proceedings of SISOM* 97, *Proceedings of the Institute of Solid Mechanics of the Romanian Academy*, Ploiesti, Romania, November 11-13**,** pp. 33-38.
14. Sireteanu, T., C. W. Stammers, I. Ursu (1997), Analysis of a sequential dry friction type semiactive suspension system, *Proceedings of Active* 97, *The* 1997 *International Symposium on Active Control of Sound and Vibration*, Budapest, August 21-23.
13. Ionescu, I., I. Ursu, F. Ursu (1997), A study concerning the analysis and semi-active vibration suppression of a beam, *Final Programme of the Annual GAMM Meeting*, Regensburg, Germany, March 24-27, p. 77.
12. Ursu, I. (1997), Some aspects concerning H_2 and H_{infinity} analysis and design of active suspensions, *Final Programme of the Annual GAMM Meeting*, Regensburg, Germany, March 24-27, p. 77.
11. Ursu, F., I. Ursu (1997), Suboptimal control algorithms for semiactive suspension systems, *Final Programme of the Annual GAMM Meeting*, Regensburg, Germany, March 24-27, p. 91.
10. Ursu, I., M. Vladimirescu, F. Ursu (1996), The receding horizon method in the synthesis of control laws for active and semiactive suspension systems, *Proceedings of CONAT 96,* 8th *International Conference on vehicle and environement*, Brasov, Romania, November 13-15, Vol. 1, pp. 311-318.
9. Ursu, I., M. Vladimirescu, F. Ursu (1996), About aeroservoelasticity criteria for electrohydraulic servomechanisms synthesis, *Proceedings of 20th Congress of the International Council of the Aeronautical Sciences*, *ICAS* 96, Sorento, Italy, September 8-13, Vol. **2**, pp. 2335-2344.
8. Popescu, F., M. Vladimirescu, I. Ursu (1996), The synthesis of an optimal controller for a double-axle-railway bogie active suspension system, *Abstracts of ECMI 96*, 9*th Conference of the European Consortium for Mathematics in Industry*, Lyngby-Copenhagen, Denmark, June 25-29, pp. 103-104.
7. Plaian, A., Ursu, F., Vladimirescu, M., Ursu, I., Sireteanu, T. (1996), Sequential semi-active suspension systems comparative in performances with LQG suspension, *Abstracts of ECMI* 96, 9*th Conference of the European Consortium for Mathematics in Industry,* Lyngby-Copenhagen, Denmark, June 25-29, pp. 100-102.
6. Ursu, I., F. Popescu, F. Ursu (1995), Concerning analysis and synthesis of an active suspension system with LQG/LTR robustness loss, *Proceedings of the International Conference of Hydropneumatic Actuation Systems*, Timisoara, Romania, October 19-22, pp. 228-230.
5. Ionita, A., I. Ursu (1995), On sensitivity of active suspension systems, *Proceedings of the International Conference of Hydropneumatic Actuation Systems*, Timisoara, Romania, October 19-22, pp. 98-106.
4. Popescu, F., F. Ursu, I. Ursu, M. Vladimirescu (1995), Mathematical modelling of hydraulic servomechanisms: robust synthesis and simulation, *Book of Abstracts of EUROSIM Congress* '95, Viena, September 11-15. Eds. F. Breitenecker, I. Hussinsky, p. 29.
3. Ursu, I., A. Halanay, F. Popescu, M. Vladimirescu (1995), A comparative study of two suspensions, active and semiactive, by taking into account the use of a predictive information, *Book of Abstracts of the ICIAM* 95 (*The Third International Congress on Industrial and Applied Mathematics*, Hamburg, Germany, July 3-7), p. 467.
2. Ionita, A., I. Ursu (1995), Robust regulator synthesis for a road car active suspension system, *Proceedings of the ESFA* '95 *Conference*, Bucharest, May 18-19 , Vol. **2**, pp. 235-240.
1. Vladimirescu, M., F. Popescu, I. Ursu (1994), Method for deriving a quasi-optimal regulator for an ABS type system, *Book of Abstracts of ICM 94* (*International Congress of Mathematicians*, Zürich, Swiss, August 3-11), p. 376.

Other journals

1. Ioan Ursu, The Space SHM Project presented at the Romanian Space Week 2015, INSIDER. An INCAS magazine, # 2 July 2015
2. INCAS participation to the NOTTE physics international experiment during the Total Eclipse of August 11, INSIDER. An INCAS magazine, # 4 March 2016
3. I. Ursu Participarea INCAS la Experimentul international de fizica din timpul Eclipsei Totale din 11 August 1999, Stiinta si Tehnica, Anul LXV, #55, Aprilie 2016
4. D. D. Ion Guta, I. Ursu, INCAS, Transfer de tehnologie aerospatiala catre domeniul sanatatii, Stiinta si Tehnica, Anul LXV, #53, Februarie 2016
5. Ioan Ursu, Smart Wing, more safety in-fligt. Fighting hazards in-flight. INSIDER. An INCAS magazine, # 6 December 2016

6. Ioan Ursu, M. Tudose, D. Enciu (2017) Health monitoring of aerospace structures using FBG and Carbon Nanotubes, INSIDER. An INCAS magazine, # 7 March 2017
7. Ilinca Nastase, Ioan Ursu, Developing an application for International Space Station, INSIDER. An INCAS magazine, # 9 December 2017
8. D. Enciu, A. Halanay, I. Ursu, G. Tecuceanu (2018) An approach of control delay for electrohydraulic servomechanism, Proc. of the 37th „Caius Iacob" Conference on Fluid Mechanics and its Technical Applications, pp. 45-48, ISSN 2067-4414
9. I. Ursu, M. Tudose, D. Enciu (2018) Accolades for Research Excellence, INCAS INSIDER, vol. 11, pp. 18-19
10. I. Ursu, M. Tudose, D. Enciu (2018) Monitorizarea activa a structurilor, Stiinta&Tehnica, vol. 76, pp. 78-81
11. D. Enciu, I. Ursu, G. Tecuceanu (2019) A problem of stabilization for the mathematical model of electrohydraulic servomechanism with control delay, ARA Journal of Sciences, no.2, pp. 39-42, DOI: 10.14510/ARAJ.2019.4226

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Dr. math. Ioan Ursu