

Final program of the 8th International Conference on
Recent Advances in Aerospace Actuation Systems and Components
May 30, June 1, 2018, Hotel Mercure Compans-Cafarelli, Toulouse, France

All full papers relative to the presentations have been received and will be included in the printed and electronic proceedings

Wednesday, 30 May 2018 - Talks

7.30 - 9.00 am, Registration

9.00 - 9.15 am, Welcome and opening address

C. CHASSOT, Director of Research, INSA Toulouse, *France*
J-C. MARE, Chair of the conference, INSA Toulouse, *France*

9.15 - 10.45 am, Session 1, GENERAL VIEW, chairman Pr. J-C. MARE

AIRBUS Research and perspectives for aircraft control actuation

N. LARRIEU, X. LAMOISSIERE, L. ANDRIEU, Airbus Operations SAS, *France*

Electro-hydraulic system architectures for more electric aircraft - Comparison of central and zonal power packages

N. TROCHELMANN, F. THIELECKE, Hamburg University of Technology, *Germany*
R. BEHR, M. HAMM, Airbus Operations GmbH, *Germany*

Spoiler and flap rotary EM actuation (REMA) implementation on a recently certified business jet

E. ZATLOFF, Curtiss-Wright Sensors and Controls Actuation Group, *United States*

10.45 - 11.15 am, Coffee break

11.15 - 12.45 am, Session 2, APPLICATION TO FLIGHT CONTROLS, chairman Pr F. THIELECKE

Pseudo direct drive electrical machine for primary flight control surface actuation

R. DRAGAN, R. CLARK, Magnomatics Ltd, *United Kingdom*
E. HUSSAIN, M. ODAVIC, K. ATALLAH, The University of Sheffield, *United Kingdom*

A model-based systems engineering approach for efficient flight control system architecture variants modelling in conceptual design

A. JEYARAJ, S. LISCOUET-HANKE, Concordia University, *Canada*

State and development of actuation system and component in China

Y. FU, X. HAN, X. LIU, H. QI, Y. WANG, J. FU, Beihang University, *China*

12.45 - 2.00 pm, Lunch

2.00 - 3.30 pm, Session 3, RELIABILITY AND HEALTH MONITORING, chairman Pr. G. JACAZIO

Reliability of the electronics for actuation?

M. TODESCHI, Airbus Operations SAS, *France*

Linear EMA HM using oil detection

F. VAN DER LINDEN, German Aerospace Center (DLR), *Germany*
A. DORKEL, Liebherr-Aerospace Lindenberg GmbH, *Germany*

First practical evaluation of a complete Fail-safe and 100% fault-tolerant inverter for critical load in aerospace application

F. RICHARDEAU, S. VINNAC, F. MOSSER, Laplace - INP Toulouse - Univ. P. Sabatier - CNRS, *France*
A. BOETSCH, S. CHILLON, D. HORS, Zodiac Actuation Systems, *France*
A. RASHED, Centum Adénéo, *France*
M. KABALO, B. IMBERT, Toulouse Tech Transfert, *France*

3.30 - 4.00 pm, Coffee break

4.00 - 5:30 pm, Session 4, APPLICATION TO LANDING GEARS, chairman M. BESLIU

Electromechanical actuation for landing gear application: A case study on end-stroke impact in case of high speed free-fall emergency extension

M. PALMIERI, G. PISPOLA, D. CURRI, UmbraGroup S.p.A., *Italy*
C. BRACCESI, F. CIANETTI, University of Perugia, *Italy*

Physical modeling and bond graph combined approach to guide failure analysis in an aircraft hydraulic brake system

M. MAIA NETO, L. GOES, Instituto Tecnológico de Aeronáutica São José dos Campos (ITA), *Brazil*

Overview of Integrated Self-Powered Brake System for aircrafts

X. LIU, Y. SHANG, Z. JIAO, S. WU, H. QIAN, Beihang University, *China*

Thursday, 31 May 2018 - Talks

8.30 - 10.30 am, Session 5, TESTING, chairman Pr G. DI RITO

Virtual testing of aircraft hydraulic systems

L. NORDMANN, F. THIELECKE, Hamburg University of Technology, *Germany*
P. LÜCKEN, M. HAMM, Airbus Operations GmbH, *Germany*

Automated measurement of backlash and stiffness in electro-mechanical flight control actuation

C. SCHALLERT, R. KOWALSKI, German Aerospace Center (DLR), *Germany*
M. ROTTACH, A. DORKELE, Liebherr-Aerospace Lindenberg GmbH, *Germany*

Methodologies and test-rig configurations for the experimental improvement of aerospace flight control actuation systems

E. EROFEEV, L. KHALETSKY, A. SKRYABIN, A. STEBLINKIN, Central Aerohydrodynamic Institute (TsAGI), *Russia*

Flight control system architecture comprehensive evaluation based on electrical actuators for more electric aircraft

Z. BAI, Y. LEI, Z. LIU, Beijing Aeronautical Science & Technology Research Institute of COMAC (BASTRI), *China*

10.30 - 11.00 am, Coffee break

11.00 - 12.30 am, Session 6, EMA SIZING, Chairwoman Dr S. LISCOUET-HANKE

EMADEF: a fully comprehensive analytical tool for the initial design of electro-mechanical servo-actuators for primary flight controls

A. DELLACASA, G. JACAZIO, A. ZUNINO, Politecnico di Torino, *Italy*

Optimization of primary flight control actuation system using parametric sizing models of actuators, power electronics and structural analysis

S. DELBECQ, J. PIATON, B. DAGUSE, Safran Electronics & Defense, *France*
M. BUDINGER, D. LERAY, Institut Clément Ader (ICA), Institut National des Sciences Appliquées (INSA), *France*

Power cycling reliability and thermal performances of SiC power modules

S. OGE, J-P. BERTINET, T. FRAPPE, S. HAMEAU, Thales, *France*

12.30 - 2.00 pm, Lunch

2.00 - 3.30 pm, Session 7, NUT-SCREWS, chairman Pr. M. BUDINGER

Challenges of ball screw lifetime calculation in primary flight control applications

C. KUPFER, F. THIELECKE, Hamburg University of Technology, *Germany*
M. ROTTACH, Liebherr-Aerospace Lindenberg GmbH, *Germany*

High fidelity model for efficiency calculation of ball screws for flight control actuators

A.C. BERTOLINO, G. JACAZIO, S. MAURO, M. SORLI, Politecnico di Torino, *Italy*

A novel industry-oriented EMA model for ball screw optimised design including motor torque response and friction

D. CULLA, I. IGLESIAS, Tecnalia Research and Innovation (TRI), *Spain*
X. KORTA, Korta Group, *Spain*

3.30 - 4.00 pm, Coffee break

4.00 - 5.30 pm, Session 8, HYDRAULICS, Chairman L. ANDRIEU

Development of an innovative piezo actuated flow servovalve with additive manufacturing body

C. MAILHAN, J-L. BERTRAND, E. DOYEN, F. SOUBRAS, Zodiac Hydraulics, *France*

The hydraulic infinite linear actuator applied to a high lift system

M. LANDBERG, T. JERLVALL, Saab Aeronautics, *Sweden*
P. KRUS, Linköping University, *Sweden*

Implications of the use of flux-switching motors for aerospace actuation systems

T. SAWATA, P. SANGHA., UTC Aerospace Systems, *United Kingdom*

6.30 pm, Private visit of the *Muséum de Toulouse*, 35 allées Jules Guesde 31000 Toulouse

8.00 pm, Conference banquet at restaurant Le Moai, 35 Allée Jules Guesde, 31000 Toulouse

Friday, 1st June 2018 - Talks and tutorial

8.30 - 10.30 am, Session 9, CONTROL, chairman Dr I. HAZYUK

Fault-tolerant control system of the directional runway dynamics of small aircrafts with hydraulic differential brakes

G. DI RITO, F. SCHETTIN, R. GALATOLO, Universita di Pisa, *Italy*

Aircraft control using actuator current

F. VAN DER LINDEN, G. LOOYE, T. S. C. POLLACK, German Aerospace Center (DLR), *Germany*

Research on the operating modes and force fighting of hybrid actuation system based on EHA/SHA

Z. LIU, S. XU, Z. BAI, Beijing Aeronautical Science & Technology Research Institute of COMAC (BASTRI), *China*

Identifying enhancement potentials of actuation systems using a criticality index

L. AKOTO CHAMA, O. BERTRAM, German Aerospace Center (DLR), *Germany*

10.30 - 11.00 am, Coffee break

11.00 - 12.30 am, Session 10, ADVANCED ARCHITECTURES AND DESIGNS, Chairman J-C. MARE

Highly responsive micro-EMA with regenerative recovery

A. BEESLEY, C. KAYLEY, P. PAINTER, C. WHITLEY, Triumph Group, *United Kingdom*

Active/active aileron EMA system with optimised power supply architecture

M. ROTTACH, T. IMMELER, R. LADNER, Liebherr-Aerospace Lindenberg GmbH, *Germany*

N. MAHDAVI, A. ENGLER, Liebherr-Elektronik GmbH, *Germany*

R. KOWALSKI, German Aerospace Center (DLR), *Germany*

Design considerations and test of the flight control actuators for a demonstrator for an unmanned freight transportation aircraft

A. BIERIG, S. LORENZ, M. RAHM, P. GALLUN, German Aerospace Center (DLR), *Germany*

12.30 am, End of the R3ASC'18 conference

2.00 - 5.30 pm, Tutorials on preliminary design and virtual prototyping of electromechanical actuators, INSA Toulouse, special registration required

Poster sessions during coffee breaks (to be confirmed)

Rapid prototyping method based on model-driven of flight control electrical actuation system

W. WANG, S. CAO, Q. CHEN, AVIC Qing'an Group Co. Ltd, *China*

Full paper included in the proceedings

A novel multi-fault diagnosis method of electromechanical actuator based on EEMD and DSMT

L. SUN, Beihang University, *China*

Development of flight control actuation systems based on EMAs for regional aircraft under cleansky2"

E. NOVILLO, R. MACIAS, J.A. FERNANDEZ PLAZA, F. AGUADO, CESA, *Spain*

Electromechanical actuator for thrust reverser cowl opening system

R. MACIAS, E. NOVILLO, J. FERNANDEZ, Compañía Española de Sistemas Aeronáuticos (CESA), *Spain*

Environment tests and traceability analysis for EHA EBHA and EMA of civil airplane

LI, Z. BAI, S. XIONG, Y. LEI, Beijing Aeronautical Science & Technology Research Institute of COMAC (BASTRI), *China*

From TRL 3 to TRL 6 (and "permit to fly") thanks to RTCA DO-254 or EUROCAE ED-80"

I. EGUIZABAL, E. GUZMAN, P. CASADO, J.R. GARCIA, Tecnalia, *Spain*

Innovative system integration test rig (iron bird) for the development of regional aircraft technologies

P. BRUNET, A. DEBIANE, Certia, *France*

Performance analysis of electro-hydraulic actuator based on optimal control algorithm

Z. ZHANG, L. YU, Beihang University, *China*

Superconducting electrical machines for full-electric aircraft

N. IVANOV, K. KOVALEV, V. PENKIN, S. ZHURAVLEV, R. ILYASOV, D. DEZHIN, J. NEKRASOVA, E. TULINOVA, I.

DEMOCHKO, I. KOBZEVA, Moscow Aviation Institute (MAI), *Russia*

VELAE a new generation of very high temperature electro-valve

S. NOURY, Equip'Aero Technique, *France*

Wireless and autonomous sensor for strut load monitoring

T. HEBRARD, SKF Aerospace, *France*