

Final program

Recent Advances in Aerospace Actuation Systems and Components

September 25-27, 2023, Hotel Mercure Compans-Cafarelli, Toulouse, France

Monday 25 September

2.00 pm. Welcome address - Conference opening

2.10 - 3.40 pm. Session 1. Electronics and control, Chairman J-C. Maré

Electronics in harsh environment reliability update

Salas F., Airbus Operations SAS, *France*

Comparison of SIC and GAN converters for power drive systems in aircraft applications

Cougo B., Hoffmann Sathler H., Tran D-H., Segond G., IRT Saint Exupéry, *France*

Optimisation of a torque controller for electro-mechanical flight surface actuation

Michel K., Schallert C., German Aerospace Center, *Germany*

3.40 - 4.10 pm. Coffee break

4.10 - 5.40 pm. EMAs for more efficient wings, Chairman F. Thielecke

Control surface actuation for high aspect ratio wings

Savy M., Airbus Operations SAS, *France*

An actuator system to control multiple surfaces in a morphing wing

Landberg M., Sethson M., Braun R., Krus P., Linköping University, *Sweden*

Electro-mechanical actuator for morphing winglet and innovative wingtip surfaces

Borgarelli N., D'Andrea M., Pizzoni L., Alfano L., UmbraGroup S.p.A., *Italy*

Maré J-C., INSA-Institut Clément Ader, *France*

Tuesday 26 September

8.00 - 10 am. Session 3. Hydraulics, Chairman G. Jacazio

Assessment of the electromagnetic behaviour of servovalve torque motor using reluctance network models

Ribout M., Attar B., Henaux C., Llibre J-F., Messine F.

Fluid Actuation & Control/Laboratoire Laplace/Institut d'Electronique et des Systèmes, *France*

How the sealing technology has had to evolve as a consequence of the evolution of aircraft hydraulic actuation from WWII and till today's EHA actuators and Electro Mechanic Actuation Systems

Andersen T., Garcia A. R., Trelleborg Aerospace, *Denmark/USA*

Hydraulic pressure spikes in aerospace landing gear actuation systems

Besliu M., Safran Landing Systems, *Canada* - Dieterle R., The Lee Co., *USA*

Reduction of hydraulic pressure pulsation in modern aircraft hydraulics

Metzler D., Eberl R., Zanetti De Lima L., Liebherr-Aerospace Lindenberg, *Germany*

Klaerner M., Kroll L. Chemnitz University of Technology, *Germany*

Kloft P., Kusserow T., Hydac, *Germany* - Sander M., Thielecke F., Hamburg University of Technology, *Germany*

10.00 - 10.30 am. Coffee break

10.30 - 12.00 am. Session 4. Modelling and simulation, Chairman G. Di Rito

Modeling and analysis of an electro-mechanical actuator dedicated to haptic feedback for Flight Control System

Kovel R., Amokrane M., Airbus Helicopters, *France*

Modelling methodology and practices for performance evaluation of an electrical THSA

Ma H., Fu J., School of Mechanical Engineering and Automation BeiHang University, *China*

Maré J-C., INSA-Institut Clément Ader, *France* - Xia T., Nanjing Engineer Institute of Aircraft System Jincheng, *China*

Modelling of actuators for the conceptual design phase

Dell'Amico A., Larsson F., Knöös Franzen L., Krus P., Saab AB/Linköping University, *Sweden*

12.00 am - 1.45 pm. Lunch

1.45 - 3.15 pm. Session 5. EHAs, Chairman D. Van Den Bossche

Performance verification of electro-hydrostatic nose landing gear actuation and steering

Duval M. N., Bassett S., Lammering T., Liebherr-Aerospace Lindenberg, *Germany*

A triplex electro-hydrostatic actuator with embedded servo-motor-pumps and power electronics

Zhang, P., Zhao S., Zeng S., Chen K., Zhao Y., Liu H., Wang Y., Zhang L., Hao W.

Beijing Institute of Precision, Mechatronics and Controls, *China*

De-centralized hydraulics - Enabler for future more electrical aircraft

Lima L. Z., Duval M. N., Metzler D., Lammering T., Liebherr-Aerospace Lindenberg, *Germany*

3.15 - 3.45 pm. Coffee break

3.45 - 5.15 pm. Session 6. Rotary EMAs, Chairman M. Todeschi

Rotary based actuation subsystem with dissimilar power sources

Sobolewski P., Nair S., Malenshek M., Woodward Inc., USA - Knight M., Gulfstream Aerospace Corporation, USA

New concept of electromechanical actuation system for flight control application

Onodera J., Miyazono K., Sugiura H., Nishiyama Y., Kawasaki Heavy Industries Ltd, Japan

Rotary EM actuation (REMA) implementation for a primary flight control application

Zatloff E., Curtiss-Wright Actuation Division, USA

5.45 - 11.00 pm. Free bus transfer to the Aeroscopia Museum, visit of the Museum, Conference banquet at La ferme de Pinot (200 m from the museum), free bus transfer back to Hotel Mercure

Wednesday 27 September

8.00 - 10 am. Session 7. Health monitoring, Chairman I. Hazyuk

Application of health monitoring methodologies to meet safety demands in an electromechanical actuation system

Gomez De Mariscal B., Garcia E., Gallego A., Fernandez J., Novillo E., CESA, Spain

Real-time models of EMAs supporting the development of a PHM system

Bertolino A. C., De Martin A., Jacazio G., Sorli M., Politecnico di Torino, Italy

Virtual testing of skew detection concepts for future leading edge slats

Krall K., Schubert B., Thielecke F., Hamburg University of Technology, Germany

Ladner R., Liebherr Aerospace Lindenberg, Germany

Multibody simulation of a ball screw recirculation channel jamming

Bertolino A. C., De Martin A., Jacazio G., Sorli M., Politecnico di Torino, Italy

10.00 - 10.30 am. Coffee break

10.30 - 12.00 am. Session 8. Future and space applications, Chairman D. Savino

Preparing electro-mechanical actuation technology for upcoming applications – an overview on current activities at Liebherr-Aerospace

Weber G., Dreyer N., Failenschmid A., Immler T., Giselbrecht R., Liebherr Aerospace

Lindenberg, Germany - Klöben W., August Steinmeyer GmbH, Germany

Electromechanical systems for flight control actuation

Macias R., De Pablos R., Laval N., Fernandez J. A., Aguado F., Gallego A., Novillo E., CESA, Spain

Cosin L., Chamorro A., Airbus Defence & Space, Spain

Space Rider aerodynamic surface control system

Demuysère P., Verhoeven D., Sabca, Belgium - Akitani S., Thales Alenia Space, Italy

12.00 am - 1.45 pm. Lunch

1.45 - 3.15 pm. Session 9. Testing and identification, Chairman M. Budinger

A multi-functional facility for integration tests of electrical landing gear and brake of small passenger aircraft

Bertolino A. C., De Martin A., Jacazio G., Sorli M., Politecnico di Torino, Italy

Design and implementation of an EMA Iron Bird Air Load Simulation System

Dell'Amico A., Saab AB/Linköping University, Sweden

Friction estimation for torque control of electro-mechanical flight surface actuation

Schallert C., German Aerospace Center, Germany

3.15 - 3.45 pm. Coffee break

3.45 - 5.15 pm. Session 10. MBSE and other applications of electric actuation, Chairman P. Krus

Building a requirements digital thread from concept to testing using Model-Based structured requirements applied to thrust reverser actuation system development

Herber D. R., Eftekhari-Shahroudi K., Colorado State University/Woodward Inc, USA

Pseudo-direct drive for blade pitch control actuation

Dragan R., Barrett R., Wilson G., Kinghorn R., Powell D., Magnomatics, UK

Models and indicators for actuators sizing of resonant electromechanical ice protection systems

Rafik Y., Budinger M., Institut Clément Ader, France - Pommier-Budinger V., ISAE-Supaero, France

5.15 - 5.30 pm. Conference closure

Communications included in the proceedings, without planned oral presentation, except in case of no-show of a presentation in the above list - Sorted by title

CFD heat transfer optimization for a heat exchanger of an electric motor

Dell'Uomo A., Ressegotti D., Mauro G., Notargiacomo S., Rina CSM, Italy

Romeo P., Pispola G., Ciotti M., D'Andrea M., Umbragroup S.p.A., Italy

Physics-based pump condition monitoring by mapping internal and external features

Hou S., Lyu F., Zhang J., Xu B., Li X., Guo Y., Zhejiang University, China

Validation platform using co-simulation environment FMUs validation

Jude M., Chiastek SAS, France