

8th Asian/Australian Rotorcraft Forum
October 30 - November 2, 2019

Day 1 - Wednesday, October 30

| Time | Registration Open | Workshop I | Workshop II |
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| 08:30 | Registration Open | Linear Time Invariant (LTI) Models for Integrated Flight and Rotor Control Prof. Dr. J.V.R. Prasad & Assoc. Prof. Dr. Ilker Yurttugrul Linear time periodic (LTP) models typical of rotorcraft dynamics are not suitable for control design since the majority of methods are based on linear models in time invariant (LTI) form. Also, handling qualities specifications are based on time invariant linear models, and thus, cannot be directly applied to the controller design using LTP models. Use of harmonic states provides a convenient framework for transformation of LTP models into LTI model approximations. The dynamic characterization using LTI models with harmonic states converges to that of the periodic system when the number of harmonic states increases. However, the increase of harmonic states produces a high dimensional model. Therefore, the size of the LTI model has to be reduced. As a consequence of this reduction several issues arise, for example, (a) sensitivity of model fidelity to the number of harmonic states employed, and (b) effect of harmonic state feedback on stability margins and handling qualities. Two important questions that need to be addressed for fidelity assessment and LTI model order reduction are: (a) what is the most appropriate fidelity metrics?, and (b) how to determine the minimal order LTI model approximation of a periodic system? In order to answer these questions, a detailed understanding of stability properties of LTP and LTI models with harmonic rotor, body and inflow states is needed. Further, integrated flight and rotor control cases studies are needed in order to establish a design framework capable of simultaneously accounting for stability margins and handling qualities | Achieving Reliable Failure Predictions in Composites Prof. Dr. Enin A. Armanlio & Prof. Dr. Kemal Levend Parmar Achieving quality standards needed for reliable allowables, is a standing challenge for failure predictions. To this end, an integrated approach for the diagnosis and prognosis of composites, is underscored. It encompasses: 1. Nondestructive inspection enabling 3D measurement of defect location and geometry coupled with an automated transition capability to finite element models; 2. Accurate and cost effective 3D material property measurements with a minimum number of tests and methods; and 3. Structural strength and fatigue life prognosis based upon comprehensive methods that capture the failure mechanisms associated with multiple damage modes and their interaction. Future research directions emphasize the development of composites processing simulation tools to accelerate the attainment of quality standards, high-performance hybrid material systems and high-resolution nondestructive technologies for inspection of large structures. |

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| 12:00 | Lunch | | |
| 13:30 | Shuttle Leave from Conference Convention Center to TURKISH AEROSPACE | | |
| 14:00 | Technical Tour - TURKISH AEROSPACE | | |
| 18:00 | Welcome Reception at Conference Convention Center | | |

Day 2 - Thursday, October 31

| Time | Main Hall | Room 1 | Room 2 | Room 3 | Room 4 | Room 5 |
|-------|-----------|--|--|---|---|---|
| 09:15 | | Advanced Concepts 1 Performance Analysis of a Helicopter with a Variable Speed Rotor Dong Han Department of Helicopter, Nanjing University of Aeronautics and Astronautics, Nanjing 210016, China | Aerodynamics 1 Numerical Simulation of the Aerodynamic Interference of the Rotor/Fuselage in the transition state of the Quad-Tiltrotor UAV Du Silian ¹ , Zhao Qijun ¹ , Wang Bo ² ¹ Jiangsu Key Laboratory of Advanced Manufacturing Technology, HuaYin Institute of Technology, Huai'an 223003, China; ² National Key Laboratory of Rotorcraft Aeronautics, Nanjing University of Aeronautics and Astronautics, Nanjing, 210016, China | Development Programs 1 Rotary wing first of class flight trials to HMS Queen Elizabeth Mark White ¹ , Anthony Lawrence Dyer ² , Scott McQuaid ³ , Natalie Taylor ⁴ , Gordon Stewart ⁵ , Harry Boden ⁶ , Adam Hare ⁷ , Steven Badde ⁸ , Hardiman Keith ⁹ ¹ QinetiQ, MoD Boscombe Down, UK ² Rotary Wing Test & Evaluation Squadron, MoD Boscombe Down, UK | Dynamics 1 Power-on Effect on Longitudinal Stability in Quad Tilt Propeller Aircraft Yubo Lee ¹ , Seonggi Lee ² , Sejong Oh ³ , Jaehun Choi ⁴ , Yungyeo Lee ⁵ , Taehwan Cho ⁶ , Donghun Park ⁷ ¹ Aerospace Engineering, Pusan National University, Pusan, South Korea ² Hyundai Rotem Company, Gyeonggi-do, South Korea ³ Korea Aerospace Research Institute, Daejeon, South Korea ⁴ Dynamic characteristics of tilt-rotor systems on advanced high-altitude VFRV vehicles Sungwoo Zhang, Bo Wang, Qijun Zhao, Guozhong Zhao National Key Laboratory of Rotorcraft Aeronautics, Nanjing University of Aeronautics and Astronautics, Nanjing, China | Structures 1 Stiffness tailoring of rotor blades using hybrid corrugated austenitic metastructures Huan Huan Zhu Department of Mechanical and Aerospace Engineering, Seoul National University, Seoul, Korea |
| 09:45 | | Comparison of the AFCS in Mechanical and Fly-By-Wire FCs Abderrahman Yasin Younes, Mehmet Bilgin, Abdullah Vural Turkish Aerospace | Investigation of Aerodynamic Interaction of a Lift Off-Coast Rotor for Numerical Simulation Kaito Hara ¹ , Hideaki Sugawara ¹ , Yasutada Tanabe ² , Masaharu Kamada ³ ¹ Department of Mechanical Systems Engineering, Tokyo University of Agriculture and Fisheries, Tokyo, Japan ² Aviation Systems Research Unit, Japan Aerospace Exploration Agency, Tokyo, Japan ³ Central Research Institute of Electric Power Company, Japan | Requirements Management within Model Environment Yolkan Mert Turkish Aerospace | Design high stiffness and light weight custom made helmet using metamorphic and non-metamorphic materialization Muzee Al Ali, Hussaid Al Ali Muzee Al Ali, Alayan University, School of Dentistry, ThiQar, Iraq | |
| 10:15 | | Latest Developments in Ship Helicopter Operational Limitations Flight Test Abderrahman Yasin Younes Aeromath, Den Haag, The Netherlands | An Aerodynamic Study for JAXA High Speed Compound Helicopter by a Wind Tunnel Test Noboru Kobayashi ¹ , Yasutada Tanabe ² , Hideaki Sugawara ³ ¹ JAXA ² JAXA ³ Royco Systems Co., Ltd. | Flight Test Risk Calculator (RIZIKO) Erin Kocademir, Ergil Balcioglu, Cagın Ökür, İker Uysal, Meriç Erdem, Arif Ates, Filizhan Vitan Turkish Aerospace, Flight Test, Ankara, Turkey | Vibration reduction of lift-off-set compound helicopters using two-step surface vibration control Jin Lee ¹ , Do Hyung Kim ² , Jae Sang Park ³ , Sung Boo Hong ⁴ ¹ Department of Aerospace Engineering, Chungnam National University, Korea ² Aircraft System Division, Korea Aerospace Research Institute, Korea | Structural Analysis and comparison of loading capability of CNT fibre and Carbon fibre Bansika Saha, Dinesh Kumar Hanuramphath Aerospace Engineering, Indian Institute of Science, Bangalore, India |

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| 10:45 | Coffee Break | | | | | |
| 11:00 | | | | | | |

| Time | Main Hall | Room 1 | Room 2 | Room 3 | Room 4 | Room 5 |
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| 11:00 | | Unmanned Systems 1 Optimal Adaptive Transition Control of a VTI-Prog VTOL UAV Metehan Yalcin, Murat Sempik, Osman Gunger, Levant Cehner, Ali Turker Kayar, Tarkan Tokdemir Aerospace Engineering, Middle East Technical University, Ankara, Turkey | Aerodynamics 2 Multi-Rotor Finite State Wake Models Based on Superposition Approach: VFRV and PPHCM Feyyaz Guner ¹ , V. R. Prasad ² ¹ School of Aerospace Engineering, Georgia Institute of Technology, Atlanta, USA ² National Key Laboratory of Rotorcraft Aeronautics, Nanjing University of Aeronautics and Astronautics, Nanjing, China | Rotorcraft Design 1 Automatic Interface Testing by Using Reduced Copilot Imad Simsek, Abdullah Vural Turkish Aerospace | Dynamics 2 A numerical methodology to predict torque balanced conditions of a tip-tilt rotor Dong Han, Seo Hyung Park Department of Aerospace Information Engineering, Konkuk University, Seoul, South Korea | Structures 2 Mathematical modeling and active control of a smart rotor system based on the transfer matrix method Yun Wang, Feng Xie National Key Laboratory of Rotorcraft Aeronautics, College of Aerospace Engineering, Nanjing University of Aeronautics and Astronautics, Nanjing, China |
| 11:30 | | The Effects of Weighing Matrices on SDRE Based Control Method of 3-Dof Helicopter Sinan Özcan ¹ , Ahmet Çağrı Arcaç ² , Engin Hasan Çopur ³ , Metin Uymaz Salamaç ⁴ ¹ Helicopter Division, Turkish Aerospace Headquarters, Kahramanmaraş, Ankara, Turkey ² Department of Mechanical Engineering, Faculty of Engineering, Gazi University, Ankara, Turkey ³ Department of Space and Satellite Engineering, Faculty of Aviation and Space Sciences, Necmettin Erbakan University, Konya, Turkey | Aerodynamic Characteristics of a Quad-Rotor-Drone with Ducted Rotors Koichi Yonezawa ¹ , Hiromasa Matsumoto ² , Kazuyasu Sugiyama ³ , Yasutada Tanabe ⁴ , Hiroshi Tokuda ⁵ , Shinsuke Sumada ⁶ ¹ Central Research Institute of Electric Power Company, Japan ² Osaka University, Japan ³ Japan Aerospace Exploration Agency ⁴ Osaka University, Japan ⁵ Nagoya University, Japan | Analysis on radar scattering characteristics of helicopter based on finite-volume time-domain method Yongqiang Jiang, Bo Wang, Qijun Zhao, Xiangwen Jiang National Key Laboratory of Rotorcraft Aeronautics, Nanjing University of Aeronautics and Astronautics, Nanjing, China | Design of the Maryland Tiltrotor Rig Hingeless Hub Rajesh Gul, Anubhav Datta University of Maryland, College Park, Maryland, 20742, U.S.A. | Aerodynamic stability analysis of composite blades based on cross-section metamorphic materialization Lijie Qiu, Kai Zhang National Key Laboratory of Rotorcraft Aeronautics, Nanjing University of Aeronautics and Astronautics, Nanjing, China |
| 12:00 | | Assessment of Fault Tolerant Estimation For Light Utility Helicopter Response Özdem Dökme ¹ , Çingir Hajiyev ² ¹ Özdem Dökme, Turkish Aerospace Industries Inc. (TAI), Ankara, TURKEY ² Çingir Hajiyev, Faculty of Aeronautics and Astronautics, Istanbul Technical University, Istanbul, TURKEY | Influence of Rotor Blade Twist on the Ducted Rotor Performance Yasutada Tanabe ¹ , Hideaki Sugawara ² , Koichi Yonezawa ³ , Shigeru Sumada ⁴ ¹ Japan Aerospace Exploration Agency (JAXA) ² Royco Systems Co. Ltd. ³ Central Research Institute of Electric Power Industry ⁴ Nagoya University | TOROS Model Linearization by Subspace Identification Sevil Arslan ¹ , Yusuf Onur Arslan ² ¹ Turkish Aerospace ² Turkish Aerospace | Flutter Control Analysis of an Aircraft Wing using Carbon Nanotubes Reinforced Polymer Timothy Gideme, Xia Ping College Aerospace Engineering, Nanjing University of Aeronautics and Astronautics, Nanjing, China | Reliability Analysis of Multi-State on Helicopter Emergency Flotation Review King Gao, Jianhong Sun, Bin Hou, Zhi Sun Key Laboratory of Aircraft environment control and life support, MIIT, Nanjing University of Aeronautics & Astronautics, Nanjing, 210016, China |

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| 12:30 | Lunch | | | | | |
| 13:30 | Keynote Speech Session (Main Hall) | | | | | |
| 14:00 | Keynote - ARF Representative, China/Japan/India/Australia/Turkey | | | | | |
| 14:30 | Update of Rotorcraft R&D Activities | | | | | |

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| 16:00 | Coffee Break | | | | | |
| 16:00 | | | | | | |

| Time | Main Hall | Room 1 | Room 2 | Room 3 | Room 4 | Room 5 |
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| 16:00 | Development Programs 2 Independent Development of Helicopter Flight Dynamic Models for Full Flight Simulators Ilker Yurttugrul Middle East Technical University, Ankara Turkey | Unmanned Systems 2 Markovian Approach for Learning Based Flight Condition Recognition Methods Ilker Yurttugrul, Murat Sempik, Arda Yücelkaya Turkish Aerospace, Ankara, Turkey | Aerodynamics 3 Investigation on Aerodynamic Efficiency of Multi-Ducted Fan in Forward Flight Ilker Yurttugrul, Donghun Park, Sejong Oh Department of Aerospace Engineering, Pusan National University, Busan, South Korea | Rotorcraft Design 2 Effect of Lift and Thrust Share on Flight Performance of a Compound Helicopter Kelong Tang National Key Laboratory of Science and Technology on Rotorcraft Aeronautics, College of Aerospace Engineering, Nanjing University of Aeronautics and Astronautics, Nanjing 210016, China | Dynamics 3 Bell 412 System Identification and Model Fidelity Assessment for Hover and Forward Flight Susanne Seher-Wess ¹ , Mark B. Tischer ² , Pavle Scepanovic ³ , Arthur Gubbeis ⁴ ¹ DLR Institute of Flight Systems, Braunschweig, Germany ² Aviation Development Directorate, CCDC Aviation & Missile Center, Moffett Field, CA ³ NRC Flight Research Laboratory, Ottawa, Ontario, Canada ⁴ Dynamic characteristics of tilt-rotor systems on advanced high-altitude VFRV vehicles Sungwoo Zhang, Bo Wang, Qijun Zhao, Guozhong Zhao National Key Laboratory of Rotorcraft Aeronautics, Nanjing University of Aeronautics and Astronautics, Nanjing, China | Structures 3 Highly efficient structural optimization of wind turbine blade sections using a mixed beam approach with Bézier curves Jin Seung Park, Sung Nam Jung Konkuk University |
| 17:00 | Maiden Flight of T625 Gökbey Helicopter Erin Kocademir, Gökhan Vitan, Arif Ates, Çağrı Çakıcı, İker Uysal, Meriç Erdem, Etil Balcioglu, Alper Kurudolu Turkish Aerospace, Flight Test, Ankara, Turkey | LOGICAL ALGORITHM DESIGN WITH STATE MACHINERY APPROACH FOR AIRCRAFT FLIGHT CONTROL SYSTEMS OF ANTI-CRASH Sinan Özcan ¹ , Mustafa Güler, Serdar Türel Helicopter Division, Turkish Aerospace Headquarters, Kahramanmaraş, Ankara, Turkey | Mechanism research on Rotor BVI Noise Reduction by Parameter Analysis of HST Method Sung Chul, Bo Wang, Qijun Zhao National Key Laboratory of Science and Technology on Rotorcraft Aeronautics, Nanjing University of Aeronautics and Astronautics, Nanjing, China | T625 Mathematical Model Integration for Rapid Pilot-in-the-loop Enre Soranler, Semih Yavuz, Emre Karadas Turkish Aerospace, Helicopter Division, Flight Mechanics and Autopilot Systems, Ankara, Turkey | Stability and controllability assessment of water tank release procedure from a tiltrotor helicopter in fire-fighting operations Yildirim Kemal Yılmaz, Arda Çelikkhan, Aydın Bırol Akdemir, Öge Kapulu Güllüç Turkish Aerospace, Ankara, Turkey | Composition of three-dimensional finite element structural analysis method based on the V-ratio structural images of HART II blades Ilker Yurttugrul Aerospace Information Engineering, Konkuk University, Seoul, Korea |
| 17:30 | Retrospective Analysis of Australia's Defence Aviation Safety Framework Arindam Saha, James Hood, Pier Marozca RMIT University, Australia | Design and Evaluation of Flight Control System for Unmanned Compound Rotorcraft Sung Wook Lee, Sang Ho Kang, Chang Jo Kim Department of Aerospace Information Engineering, Konkuk University, Seoul, Republic of Korea | Numerical Study of Air-Launched Projectiles for Fixed and Rotary Wing Aircraft Safety Sung Chul, Jo Ohn Keon Korea Advanced Institute of Science and Technology | In-Flight Test Campaign to Validate PID Detection and Assessment Tools Hakan Özkan ¹ , Marc Alexander ² , Marc Höfner ³ , Miles Barnes ⁴ , Perry Comeau ⁵ , Arthur Gubbeis ⁶ ¹ Rotorcraft Department, Institute of Flight Systems, DLR, Braunschweig, Germany ² Flight Research Laboratory, Ottawa, Canada ³ Flight Experiments, DLR, Braunschweig, Germany ⁴ Multi-body Simulation of Helicopter Rotor with Flexible Blade and Hub for Start-up and Shut-down Conditions ⁵ ILR Institute of Flight Systems, Braunschweig, Germany ⁶ DLR Institute of Flight Systems, Braunschweig, Germany | Vibration reduction of lift-off-set compound helicopters using two-step surface vibration control Jin Lee ¹ , Do Hyung Kim ² , Jae Sang Park ³ , Sung Boo Hong ⁴ ¹ Department of Aerospace Engineering, Chungnam National University, Korea ² Aircraft System Division, Korea Aerospace Research Institute, Korea | Effect of lay-up orientation and crack length propagation on fracture toughness of FRP and GFRP laminates Bansika Saha ¹ , Levent Parmar ² , Demirkan Çoker ³ ¹ Turkish Aerospace, Power Transmission Systems Design, Ankara, Turkey ² Mechanical Engineering, TED University, Ankara, Turkey |
| 18:00 | Safety of flight tests for the maiden flight of prototype helicopters "T625 Gökbey razer" Erin Kocademir, Meriç Erdem, Çağrı Çakıcı, İker Uysal, Etil Balcioglu, Arif Ates, Gökhan Vitan Turkish Aerospace, Flight Test, Ankara, Turkey | Dynamic Interface Modelling and Simulation. Part 1: Preparation and Analysis for High-Fidelity Helicopter-Ship Flight Simulations Abderrahman Yasin Younes, İsmail Özdemir, İsmail Özdemir, İsmail Özdemir University of Liverpool, Liverpool, United Kingdom | Multibody analysis of the influence of strut-mounted vibration alleviation devices on rotor aeromechanics Abdulrahman Yasin Younes, Matteo Daniele, Pierangelo Hesarati Department of Aerospace Science and Technology, Politecnico Di Milano, Milano, Italy | 2D and 3D Modelling of Delamination in Tapered Composite Laminates Under Compressive Flexure Serdar Huseynov, Dursun Karadas, Levent Parmar ² ¹ Department of Mechanical Engineering, Middle East Technical University, Ankara, Turkey ² Department of Mechanical Engineering, Tez University, Ankara, Turkey ³ Department of Aerospace Engineering, Middle East Technical University, Ankara, Turkey ⁴ Mechanical & Material Characterization of Nomex used in Helicopter Blades ⁵ Mechanical Engineering, Middle East Technical University, Ankara, Turkey ⁶ Department of Aerospace Engineering, Indian Institute of Science, Bangalore, India ⁷ Department of Mechanical Engineering, Indian Institute of Science, Bangalore, India | Flight Data Processing for helicopter mathematical model validation Uğurcan Özkan Turkish Aerospace | Investigating Effects of Shrouding Length on the Windage Power Losses of a Spur Gear Ali Kuvvet Kuvvet, Mehmet Ali Yavuz ² , Murat Kadri Aktaş ³ ¹ Turkish Aerospace, Power Transmission Systems Design, Ankara, Turkey ² Mechanical Engineering, TOBB ETU, Ankara, Turkey |

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| 20:30 | Gala Dinner | | | | | |
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Day 3 - Friday, November 1

| Time | Main Hall | Room 1 | Room 2 | Room 3 | Room 4 | Room 5 |
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| 08:30 | Computational investigation of aerodynamic and acoustic characteristics of a ducted rotor system of a tilt-rotor aircraft Jin Seung Park, Duck Joo Lee ² ¹ Mechanical Engineering Research Institute, Korea Advanced Institute of Science and Technology, Daejeon, Republic of Korea ² Department of Aerospace Engineering, Korea Advanced Institute of Science and Technology, Daejeon, Republic of Korea | Rotorcraft Design 3 Rotor Stall Onset Assessment Etil Balcioglu, Arda Yücelkaya, Osman Güngör, Yüksel Ortakaya Pinar Arslan Dülger, Arda Yücelkaya, Osman Güngör, Yüksel Ortakaya Turkish Aerospace | Dynamics 4 Generation of Helicopter Pull-Up Maneuver with Harmony Search Optimization Method Etil Balcioglu, Uğur Kalkan ² , Harun Yılmaz ³ , Yusuf Yaman ⁴ ¹ Turkish Aerospace Helicopter Vice Presidency, Ankara, Turkey ² Aerospace Engineering Department, Middle East Technical University, Ankara, Turkey ³ Aviation Systems Research Unit, Japan Aerospace Exploration Agency, Tokyo, Japan ⁴ Department of Aerospace Science and Technology, Politecnico Di Milano, Milano, Italy | Structures 4 Fatigue test of a composite structure instrumented with Fiber Bragg Gratings sensors for structural health monitoring applications Cassio Lopes, Boray Çelikkhan ² , Hediye Sahan ³ ¹ Turkish Aerospace ² Middle East Technical University ³ Department of Mechanical Engineering, Middle East Technical University, Ankara, Turkey | Unmanned Systems 3 Can Time-To-Contact Be Used To Model A Helicopter Autorotation? Michael Jump, Neil Cameron Flight Science and Technology Research Group, Department of Mechanical, Electrical & Aerospace Engineering, The University of Liverpool, Liverpool, United Kingdom | Propulsion and Drive 1 Nonlinear Forced Response Analysis of Bladed Disks With Wedge Resonance Ali Hakan Kuvvet, Ender Cengizci Middle East Technical University |
| 09:00 | Aerodynamic stability analysis of rotor during ramp collective pitch maneuvers by FRF method Etil Balcioglu, Q Jun Zhao, Bo Wang, Xia Yang Zhang National Key Laboratory of Rotorcraft Aeronautics, Nanjing University of Aeronautics and Astronautics, Nanjing, China | Architectural composition of models by Simulink System Composer Yolkan Mert Turkish Aerospace | 2D and 3D Modelling of Delamination in Tapered Composite Laminates Under Compressive Flexure Serdar Huseynov, Dursun Karadas, Levent Parmar ² ¹ Department of Mechanical Engineering, Middle East Technical University, Ankara, Turkey ² Department of Mechanical Engineering, Tez University, Ankara, Turkey ³ Department of Aerospace Engineering, Middle East Technical University, Ankara, Turkey ⁴ Mechanical & Material Characterization of Nomex used in Helicopter Blades ⁵ Mechanical Engineering, Middle East Technical University, Ankara, Turkey ⁶ Department of Aerospace Engineering, Indian Institute of Science, Bangalore, India ⁷ Department of Mechanical Engineering, Indian Institute of Science, Bangalore, India | Stability and controllability assessment of water tank release procedure from a tiltrotor helicopter in fire-fighting operations Yildirim Kemal Yılmaz, Arda Çelikkhan, Aydın Bırol Akdemir, Öge Kapulu Güllüç Turkish Aerospace, Ankara, Turkey | Research on Key Technologies of Shipborne Hybrid Tiltrotorcraft Çağrı Çakıcı ¹ , Çınar Sun ² , Xiaodong Lu ³ ¹ National Key Laboratory of Rotorcraft Aeronautics ² Nanjing Life Aviation Technology Co., Ltd. | |
| 09:30 | Viscous Vortex Particle Method Explored for Main Rotor-Tail Rotor Interaction Abderrahman Yasin Younes Turkish Aerospace | Dynamic Interface Modelling and Simulation. Part 2: Developing Robust Reliable Requirements for Maritime Rotorcraft Flight Simulations Wahid Ahmed Watan, Neale Alexander Watson, Mark Dermot White, Ivan Owen Flight Science and Technology, School of Engineering, University of Liverpool, Liverpool, UK | Effects of Variable Trailing Edge Flap on Rotor Rolling Moment Characteristics Sung Chul, Q Jun Zhao, Bo Wang, Xia Yang Zhang National Key Laboratory of Rotorcraft Aeronautics, College of Aerospace Engineering, Nanjing University of Aeronautics and Astronautics, Nanjing, China | Evaluation of Tactile Cues for Fly-By-Wire Helicopters Bülent Etil Balcioglu, İker Yurttugrul Middle East Technical University | Investigating Effects of Shrouding Length on the Windage Power Losses of a Spur Gear Ali Kuvvet Kuvvet, Mehmet Ali Yavuz ² , Murat Kadri Aktaş ³ ¹ Turkish Aerospace, Power Transmission Systems Design, Ankara, Turkey ² Mechanical Engineering, TOBB ETU, Ankara, Turkey | |

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| 10:30 | Coffee Break | | | | | |
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| Time | Main Hall | Room 1 | Room 2 | Room 3 | Room 4 | Room 5 |
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| 10:30 | | Dynamic Interface Modelling and Simulation. Part 2: Developing Robust Reliable Requirements for Maritime Rotorcraft Flight Simulations Wahid Ahmed Watan, Neale Alexander Watson, Mark Dermot White, Ivan Owen Flight Science and Technology, School of Engineering, University of Liverpool, Liverpool, UK | Computational Analysis of Advanced Geometry Rotor Blades Yusuf Ersoy, Mehmet Özgünçü, Öge Özdemir ³ ¹ Istanbul Technical University ² Gumush Aerospace and Defence ³ Middle East Technical University | Feed Forward Decoupling Controller Design for a Helicopter Aytekin İlgin, İsmail Hakkı Şevkin Turkish Aerospace, Helicopter Division, Flight Mechanics and Autopilot Systems, Ankara, Turkey | Effect of Lift Share Ratio on the Aerodynamic Performance of a Winged Tiltrotor Helicopter Hidaki Sugawara ¹ , Yasutada Tanabe ² , Masaharu Kamada ³ ¹ Royco Systems Co., Ltd.; ² Tokyo University of Agriculture and Technology ³ Japan Aerospace Exploration Agency | Multi-objective optimization design for rotor airfoil under unsteady conditions Sungwoo Zhang, Qijun Zhao, Guozhong Zhao National Key Laboratory of Rotorcraft Aeronautics and Astronautics |
| 11:00 | | Sensitivity Analysis and Multi-disciplinary Design Optimization of Composite Rotor Blade Daewon Lee ¹ , Jongsun Baek ² , Sunghwan Jung ³ , Kwansu Yoo ⁴ ¹ Department of Mechanical & Aerospace Engineering, Seoul National University, Seoul, Republic of Korea ² Department of Aerospace Information Engineering, Konkuk University, Seoul, Republic of Korea | Effects of Variable Trailing Edge Flap on Rotor Rolling Moment Characteristics Sung Chul, Q Jun Zhao, Bo Wang, Xia Yang Zhang National Key Laboratory of Rotorcraft Aeronautics, College of Aerospace Engineering, Nanjing University of Aeronautics and Astronautics, Nanjing, China | Evaluation of Tactile Cues for Fly-By-Wire Helicopters Bülent Etil Balcioglu, İker Yurttugrul Middle East Technical University | Investigating Effects of Shrouding Length on the Windage Power Losses of a Spur Gear Ali Kuvvet Kuvvet, Mehmet Ali Yavuz ² , Murat Kadri Aktaş ³ ¹ Turkish Aerospace, Power Transmission Systems Design, Ankara, Turkey ² Mechanical Engineering, TOBB ETU, Ankara, Turkey | Aerodynamic design optimization of helicopter rotor airfoil Onur Çınar, Alper Ertenler Turkish Aerospace, Helicopter, Ankara, Turkey |
| 11:30 | | Evaluation of Surge-Based Modeling Methods for the Optimization of Helicopter Rotor Structures for Minimum Vibration H. Ersoy, Ender Cengizci ² , H. Nevzat Özgünçü ³ ¹ Middle East Technical University | Preliminary Study on Innovative Loop Propellers for Quiet VTOLs Etil Şenay, Seiji Tsutsumi, Keischo Fujimoto Japan Aerospace Exploration Agency | Comparison of the AFCS in Mechanical and Fly-By-Wire FCs Abderrahman Yasin Younes, Mehmet Bilgin, Abdullah Vural Turkish Aerospace | Preliminary Design of a Set of Airfoils Applied to Coaxial Rotors Zin Zhao, Si Meng Jing College of Aerospace Engineering, Nanjing University of Aeronautics and Astronautics | Vortex structure research for the isolated helicopter's main rotor model Lila Hakimeyeva ¹ , Vladimir Pakhov ² , Robert Stepanov ³ ¹ Nanjing University of Aeronautics and Astronautics, Nanjing, China ² Kazan National Research Technical University named after A.N.Tupolev - KAI, Kazan, Russia |

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| 12:00 | Lunch | | | | | |
| 13:00 | Invited Speaker - Dr. Eilif Ahci (GaTech Graduate- Rotorcraft / Aerospace Professional) | | | | | |
| 13:30 | Invited Speaker - Mr. Mike Hirschberg (VFS International) | | | | | |
| 14:00 | ERF2018 Best Paper | | | | | |
| 14:30 | Invited Speaker - TBD | | | | | |

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| 18:00 | Coffee Break | | | | | |
| 18:00 | | | | | | |

| Time | Main Hall | Room 1 | Room 2 | Room 3 | Room 4 | Room 5 |
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| 15:30 | Operation and Prospect of Helicopter Emergency Medical Service in Republic of Korea Dong Han, Duck Joo Lee Operation and Prospect of Helicopter Emergency Medical Service in Republic of Korea(2) | A Multidisciplinary Design Optimization Study of Unmanned Tilt-Wing Rotorcraft Serdar Huseynov, Berkay Pirpirali, Yeliz Saka, Burak Korkut Rotorcraft Engineering, Istanbul, Turkey | Experimental analyses of synthetic jet control effects of rotor Zhang Jie, Qijun Zhao, Si Chen Nanjing University of Aeronautics and Astronautics | Mission-based Optimal Morphing Parameters for Rotors with Combined Forward and Tail Rotors Rafael Ramirez, Stephen Benz ² ¹ Rotorcraft, Institute of Flight Systems, German Aerospace Center (DLR), Braunschweig, Germany ² Department of Mechanical and Aerospace Engineering, Technical University, Braunschweig, Germany | Tip Vortex Characteristics of Rotor Blades with Tip Modifications Srinivas Uthukul ¹ , Ramesh Anur Hassan ² , Mustafa Peric ³ , Qunqun Liang ⁴ ¹ Turkish Aerospace Industries, Ankara, Turkey; ² Department of Aerospace Information Engineering, Middle East Technical University, Ankara, Turkey ³ METU Center for Wind Energy Research, Middle East Technical University, Ankara, Turkey ⁴ METU Center for Wind Energy Research, Middle East Technical University, Ankara, Turkey | Design of an Experimental Setup for Periodic Forced Response Analysis of Rotational Blades with Fractional Features Etil Balcioglu, Ender Cengizci Middle East Technical University |
| 16:00 | The Conceptual and Parametric Study of Antagonistic Shape Memory Alloy Actuator System for Morphing Blade Tip Hakan Hiseyin Savaş ¹ , Halil Onur Tuğrul ² , Benat Koçak ³ ¹ Turkish Aerospace Industries Inc. ² Haecettepe University | Agility Assessment of Utility & Attack Configurations Hakan Sempik, Arda Yücelkaya, Yüksel Ortakaya Turkish Aerospace, Ankara, Türkiye | A Numerical Study on Aerodynamic Interference from Different Configurations of Helicopter Rotors Zhi Sun ¹ , Jianhong Sun ² , Qijun Zhao ³ , Mingqi Li ⁴ , Xing Guo ⁵ ¹ Key Laboratory of Aircraft environment control and life support MIIT, Nanjing University of Aeronautics & Astronautics, Nanjing 210016, China ² National Key Laboratory of Rotorcraft Aeronautics, Nanjing University of Aeronautics & Astronautics, Nanjing 210016, China ³ Aviation Key Laboratory of Science and Technology on Life-support Technology, Xi'an, Shaanxi 710023, China | A summary of rotary-wing SLL activities: Flight Mechanics & Control Perspectives Umut İnce, İlyas Doğu Okcu Turkish Aerospace Industries | Aerodynamic Analyses of a Simple Rotor Model for an Autogyro by using FRF and FRF Egri Orbay, İlyas Doğu Okcu Dept. of Aerospace Engineering, METU, Ankara, Turkey | Technology Identification for a Small General Aviation Helicopter Power Review Hakan İspir, Yıldırım Kemal Yılmaz ² , Alperen Yılmaz ³ ¹ Turkish Aerospace ² Innovare |
| 16:30 | Deep Vision Based Photogrammetry System for Rotor Blade Motion and Deformation Measurements Gyung Yilcol ¹ , Selma Aydin ² , Muhammed Ersoy Bilal ³ ¹ Siemens AS, Istanbul, TURKEY ² Turkish Aerospace ³ Nurse, Kyungil University, Daegu, Korea | On the cognitive errors and self-understanding index for the possible reasons of rotorcraft accidents Duck Joo Lee ¹ , Young Hak Son ² , Myeong Hyun Bae ³ , Mihai Kiril ⁴ , Eun H. Choi ⁵ , Jack Kim ⁶ ¹ Aerospace Engineering, KAIST, Daejeon, Korea ² Nurse, Kyungil University, Daegu, Korea ³ Nurse, Eulji University, Daejeon, Korea | Advanced Investigations of Rotor In Ground Effect Mehmet Sahbaz, Nilay Sezer Uzel, Dilek Filiz Kurtulug Department of Aerospace Engineering (METU)/Ankara, Turkey | Test Rig for System Characterization in Gökbey(T625) Helicopter Power Enhan Erbay, Ahmet Özturan, Alper Yasin Trkici, Yeliz Okuyan Department of Aerospace Engineering (METU)/Ankara, Turkey | Ship Airwake Investigations on SFSZ with a Hovering Helicopter Rotor by using CFD and FRF Egri Orbay, İlyas Doğu Okcu Dept. of Aerospace Engineering, METU, Ankara, Turkey | Investigation of a Multiple Disk Rotor Supported by Roller Element Bearings Under Inhomogeneous Perturbations Dokuzen Babalı, Ender Cengizci ² ¹ Turkish Aerospace ² Middle East Technical University |
| 17:00 | Utilizing rapid prototyping in fabrication of rotor blade molds Özgür Tezer, Ali Önt, Rıza Özcan HELICOPTER, TUSAŞ, ANKARA, TURKEY | Comparison between a tractor type-propeller and a pusher-type propeller for Mars airplane Koichi Yonezawa ¹ , Tomonori Kagiyama ² , Shigeru Sumada ³ , Kazuyasu Sugiyama ⁴ ¹ Central Research Institute of Electric Power Industry, Abiko, Japan ² Osaka University, Toyonaka, Japan ³ Nagoya University, Nagoya, Japan | | | | Design of A Hover Test Stand and Performance Enhancement of Actively Controlled Blades Yusuf Ersoy, Onur Çınar, Hüseyin Üral, Herve Şahin, Öge Özdemir, Okan Nurhan Çeliker Yıldırım, Melin Oshan Kara Istanbul Technical University, Faculty of Aeronautics and Astronautics |

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| 18:00 | Best Paper Award and Closing Ceremony | | | | | |
| 19:00 | End of Technical Sessions | | | | | |

Day 4 -