ERF Programme Information:

Programme ERF 2022

Monday, September 5th, 2022: (optional)

Time:	Where:	Subject:
14.00 - 17.00	Foyer	Registration

Tuesday, September 6th, 2022: DAY 1

Time:	Where:	Subject:
07:30	Foyer	Registration opens
08:45	Auditorium	Auditorium opens
09:00	Auditorium	Organizational Introduction - P. Capone
09:00 - 09:15	Auditorium	Welcome Speech - Dean of ZHAW, Prof. Dr. Jean-Marc Piveteau
09:15 - 09:30	Auditorium	Christian Mueller - Chairman European Helicopter Association
09:30 - 09:45	Auditorium	Luca Medici - Head of Aircraft System Integration Leonardo Helicopter
09:45 - 10:00	Auditorium	Guillaume Inquiété - R&T Program Manager Airbus Helicopter
10:00 - 10:30	Auditorium	Heinz Leibundgut - Chief Test Pilot REGA - Low Flight Network
10:30 - 11:00	Foyer	Coffee break

	Session	Aerodynamics I	Aircraft Design I	Flight Mechanics I	Test and Evaluation I	Dynamics I
	Room	TN E0.54	TN E0.46	TS O1.43	TN E0.58	TS 01.40
	Chairperson	Arnaud Le Pape	Luca Medici	Klausdieter Pahlke	Alan Irwin	Pierangelo Masarati

ERF Programme Information:

Time:	Where:	Subject:				
11:00 - 11:30		73 *Numerical investigation of wing-propeller aerodynamic interaction through a vortex particle-based aerodynamic solver* Alberto Savino	3 *Flight Performance of Multi-rotor Configuration Tail Rotors* George Barakos	24 *An Energy-Based Trim Procedure for Multirotor VTOLs* Caterina Poggi	2 *Experimental Evaluation of Flow Distortion at NGCTR Optimized Air Intake Full Scale Model* Remco Habing	78 *Comprehensive simulation of a complete tiltrotor with pilot-in-the-loop for whirl-flutter stability analysis* Alessandro Cocco
11:30 - 12:00		29 *High Fidelity Simulation of a Drone Propeller in Hover* Dorange Alexis	6 *Application Of Global Optimisation Algorithms to Multi-Rotor Systems* Dmitrij Usov	30 *Flight Investigation of Blended Command Model in Low Speed Maneuvering* Geoffrey Jeram	4 *Hardware-in-the-loop Evaluation of a Quick-Start System for Helicopter Gas Turbine OEI Operations Tested in Simulated Flights* Kuen Niklas	21 *Design and testing of an active vibration absorber for a helicopter rotor* Michele Zilletti
12:00 - 12:30		79 *A nonlinear unsteady vortex lattice method for aeroelastic rotor loads evaluation* Alessandro Cocco	18 *Helicopter Blade Twist Optimization in Forward Flight* Marco Lonoce	47 *Impact of Differential Torsional Rotor Cant on the Flight Characteristics of a Passenger-Grade Quadrotor* Kagan Atci	9 *Single Monitoring and Diagnostic System of a Helicopter: the Concept and the Operating Demonstrator* Aleksey Mironov	26 *Smart Twisting Active Rotor (STAR) – Pre-Test Predictions* Berend G. van der Wall
12:30 - 13:30	Foyer	Networking lunch				
	Session	Aerodynamics II	Aircraft Design II	Flight Mechanics II	Test and Evaluation II	Dynamics II
	Room	TN E0.54	TN E0.46	TS O1.43	TN E0.58	TS 01.40
	Chairperson	Barbara Ohlenforst	Sebastian Topczewski	Giuseppe Quaranta	Pierangelo Masarati	Marcello Righi

ERF Programme Information:

Time:	Where:	Subject:				
13:30 - 14:00		37 *Assessment of Reduced Order Fuselage and Blade Models for Rotorcraft Interactional Aerodynamics* Peron Stéphanie	19 *Multi-fidelity Aerodynamic and Acoustic Design and Analysis of a Heavy-lift eVTOL* Tao Zhang	61 *Non-linear (Incremental) Backstepping Control applied to Helicopter Flight* Giulia Bertolani	38 *Helicopter Augmented Control Laws for Ship Deck Landing: HACLAS ONERA/DLR Joint Team* Arti Kalra	27 *Structural filters preliminary design for the aeroservoelastic decoupling of a Next Generation Civil Tilt Rotor Technology Demonstrator* Federico Fonte
14:00 - 14:30		43 *Understanding flight test data with CFD rotor simulations: An application case on the H175 helicopter* Damien Desvigne	22 *Prevention of Retreating Blade Stall by Asymmetrically Generated Lift: Free-Flight Investigations with a Fully Autonomous Helicopter Testbed* Felix Fechner	71 *Pseudo-Inverse Simulation of Pull-Up Maneuvers at Low and High Speeds by Means of Optimization* Thiemeier Jakob	65 *Rotorcraft Pitot-Static systems calibration process to reduce error in all flight regimes and all rotorcraft configurations* Domenico Vinci	36 *Rotor Blade Modeling in a Helicopter Multi Body Simulation Based on the Floating Frame of Reference Formulation* Felix Weiss
14:30 - 15:00		51 *A Numerical Optimization Framework for Rotor Airfoil Design* Gunther Wilke	34 *Modeling the Life-Cycle Cost Effects of Distributed Electric Mobility in Army Aviation* Robert Scott	94 *Dynamic Stability and Control of Rotorcraft for Suspended Load Transportation: an Analytical Approach* Emanuele Luigi de Angelis	70 *Wind Tunnel Test of Single-Rotor Lift-Offset Due to Differential Flaps* Hideaki Sugawara	77 *Experimental test-bed for the identification of biodynamic feedthrough of helicopter-pilot systems* Andrea Zanoni
15:00 - 16:30	Coffee Break					
	Session	Aerodynamics III	Maintenance	Flight Mechanics III	Test and Evaluation III	Dynamics III
	Room	TN E0.54	TN E0.46	TS O1.43	TN E0.58	TS 01.40
	Chairperson	Arnaud Le Pape	Luca Medici	Giuseppe Quaranta	Richard Markiewicz	Marcello Righi

ERF Programme Information:

Time:	Where:	Subject:				
15:30 – 16:00		53 *Aeroelastic Dynamic Stall Computations of a Double-Swept Blade in a four-bladed Rotor Configuration* Georg Babij	13 *Use of Augmented Reality for Hybrid Mock-Up Validation in Aviation Maintainability* Paquin Raphaël	97 *An Algorithm for the Identification of Helicopter Open-Loop Transfer Functions and Reduced-Order Modeling* Claudio Pasquali	85 *Prototype Carbon Fibre Propeller Dedicated for Hybrid Power Unmanned Aerial Vehicles With MTOW up to 300 kg* Malgorzata Wojtas	118 *A multi-model and multi-objective approach to the design of helicopter flight control laws* Authié Patrick
16:00 - 16:30		57 *Tip Vortex Study of a Rotor with Double-Swept Blade Tips* Claus Christian Wolf	35 *Immersive Maintenance Review in Customer Configuration Integrated into the Support & Services 3D Production Chain with a User-Centered Approach: Review of Application to Maintenance Tooling* Marie-Line Bergeonneau	101 *Rotor Control Equivalent Turbulence Input (RCETI) Models* Mahmoud A. Hayajnh	137 *Roadmap Towards First SAS Engagement* Kaan Sansal	124 *Tiltrotor Whirl-Flutter Stability Investigation using Lyapunov Characteristic Exponents and Multibody Dynamics* Pierangelo Masarati
16:30 - 17:00		1 *Experimental Investigation of the Aerodynamic Interaction between Overlapping Propellers in Tandem for eVTOL Airplane-Mode Flight Conditions* Alex Zanotti	64 *Prediction of Helicopter Rotor Loads and Fatigue Damage Evaluation with Neural Networks* Alberto Graziani	103 *A Theoretical Basis for Adverse Aircraft-Pilot Coupling* Edward Bachelder	149 *Fabrication and static testing of a high-speed morphing rotor blade* Chaudhry Zaffir	147 *Flutter Assessment of a Rotor Blade in Steady Axial Flight based on Indicial Aerodynamics considering Blade Profile, Rotor Inflow and Wake Periodicity* Arnold Jürgen

ERF Programme Information:

Time:	Where:	Subject:				
17:00 - 17:30		93 *Stochastic Simulation of Ship Airwake in Helicopter Shipboard Operation* Neda Taymourtash	122 *HUMS Proactive Analysis for Predictive Maintenance* Diaz Alexandre	110 *Load Limiting Control: A Piloted Simulation Study* J. V. R. Prasad		
19:00	Patio	BBQ Dinner with Music Band				

ERF Programme Information:

Wednesday, September 7th, 2022: DAY 2

Time:	Where:	Subject:				
	Session	Aerodynamics IV	Aircraft Design III	Flight Mechanics IV	Test and Evaluation IV	Unmanned Rotorcraft I
	Room	TN E0.54	TN E0.46	TS O1.43	TN E0.58	TS 01.40
	Chairperson	Barbara Ohlenforst	Luca Medici	Sebastian Topczewski	Alan Irwin	Marcello Righi
09:00 - 09:30		86 *Computationally Efficient Ship Airwake Simulations for Rotorcraft Shipboard Operations Using a GPU-Accelerated Lattice-Boltzmann Solver* Erk Kurban	44 *Multi-Physic Modelling and Simulation of a Distributed Electric Propulsion System for Helicopter Anti-Torque* Massimo Brunetti	58 *Preliminary guidelines for a requirement-based approach to certification by simulation of rotorcraft* Giuseppe Quaranta	146 *Open-Loop Hover Experiment of a Mach-Scaled Snuf Rotor for Active Vibration Control* Byeonguk Im	145 *HORUS - High Operational Reliability for Unmanned Systems* Benoit Figuet
09:30 - 10:00		96 *Experimental and Numerical Study of Parallel Blade-Vortex Interaction* Andrea Colli	48 *Retrofitting an Existing Helicopter with eVTOL Capabilities: Challenges and Opportunities* Lakshmi Sankar	113 *Autorotation design and simulation for a small-scale helicopter* Daniele Fattizzo	148 *Technology Concept of an Automated System for Integration Testing* David Frisini	14 *Analysis of Flight Control and Trajectory Planning for Autonomous Ship Landing using Small-Scale UAVs* Christopher Hendrick

ERF Programme Information:

10:00 - 10:30		102 *An Unstructured Dual-Solver Hybrid Method for Multirotor eVTOL Design and Analysis* Marilyn Smith	49 *New Method for the Presizing of Heavy Lift Civil Transport Helicopters* Adnen Bourehla			16 *Application of Advanced Real-time RRT* and Incremental Backstepping Control for Rotary-wing Unmanned Aircraft Systems* JungWoo An
10:30 - 11:00	Foyer	Coffee Break				
11:00 - 12:30	Technikum	Heli landing with picture				
12:30 - 13:30	Foyer	Networking lunch				
13:30 - 14:00	Auditorium	Mike Hirschberg VFS - The Future of Vertical Flight				
14:00 - 14:30	Auditorium	VFS Alfred Gessow Best Paper Award - Toward a UAS Handling Qualities Specification: Development of UAS-Specific MTEs - Dr. Christina Ivler				
14:30 - 15:00	Auditorium	Christian Marty - Chief Technical Officer - VRMotion Switzerland				
15:00 - 15:30	Foyer	Coffee Break				
	Session	Engine and Propulsion I	Aircraft Design IV	Flight Mechanics V	Avionics and Sensors	Unmanned Rotorcraft II
	Room	TN E0.54	TN E0.46	TS O1.43	TN E0.58	TS 01.40
	Chairperson	Stuart Gates	Pierangelo Masarati	Sebastian Topczewski	Luca Medici	Giuseppe Quaranta

ERF Programme Information:

15:30 - 16:00		8 *Exhaust gases thermal impact simulation on helicopter rear structure using CFD* Buet Pierre	55 *Exploring for Aerodynamic and Structural Design Constraints in the Multi-Objective Rotor Blade Airfoil Optimization Framework* Joon Lim	127 *Hybrid Propulsion Benefit in Optimal Power Off Landings of Light Multi-Role Helicopters* Francesco Scorcelletti	28 *Automatic landing on unprepared zone* Guillaume Anoufa	112 *Scout Drone: a drone-helicopter collaboration to support HEMS missions* Michele Sesana
16:00 - 16:30		31 *Sustainable Aviation Fuel for Helicopters: Challenges, Opportunities, Way Forward* Holger Mendick	56 *Physics-Based Detailed Design of a Ducted Fan Driven Rotorcraft* SunHoo Park	128 *Comparison of Optimization Based Inverse Simulation Methods for Helicopter Maneuvers* Fatih Tosun	88 *L1 adaptive speed control for an helicopter* Giulia Bertolani	120 *Automatic Flight Control System for the Small-scale Compound Helicopter* Tomasz Cioc
16:30 - 17:00			60 *Failure Analysis Method for the presizing of Multi-rotors eVTOL* Basset Pierre-Marie	141 *Flight Path Generation for a Helicopter in Tail Rotor Failure Condition* Yusuf Onur Arslan	143 *Mixed Criticality Communication within an Unmanned Delivery Rotorcraft* Hans Dermot Doran	
17:00 - 17:30			133 *A Parametric Study on Wing Design Variables for Tandem Wing Configuration eVTOL Aircraft* Abhijnan Dikshit			
19:00 - 19:30	Casino Theater	Apéro (with Winterthur authorities)				
19:30 - 23:30	Casino Theater	Galadinner				

ERF Programme Information:

Thursday, September 8th, 2022: DAY 3

Time:	Where:	Subject:				
	Session	Engine and Propulsion II	Aircraft Design V	Simulation I	Structures and Materials I	Acoustics I
	Room	TN E0.54	TN E0.46	TS O1.43	TN E0.58	TS 01.40
	Chairperson	Stuart Gates	Pierangelo Masarati	Giuseppe Quaranta	Arnaud Le Pape	Klausdieter Pahlke
09:00 - 09:30		39 *Retrofit of Hydrogen-Powered Helicopters: an Optimal Approach* Andrea Nesci	62 *Rotorcraft Conceptual Design Methodology with Commonality Constraints* Tolga Kayabaşı	25 *Assessing Rotorcraft Recovery to an Offshore Platform using Piloted Flight Simulation and Time-Accurate Airwakes* Neale Watson	45 *A surrogate-based approach for uncertainty analysis of the ONERA 7A Rotor* Manas Khurana	20 *Experimental investigation of UAV rotor aeroacoustics and aerodynamics with computational cross-validation* Anna Kostek
09:30 - 10:00		119 *Full Electric Helicopter Anti-Torque* Stoll Martin	68 *Prop-blade Section Design Optimization using Weight/Dynamic Characteristic Surrogate Model with Skin/Spar Design Variable* Taejoo Kim	150 *STORM, the New Airbus Rotorcraft Simulation Tool Based on 60 Years of Cumulated Experience in Digital Flight Physics* Didier Casolaro	107 *Increasing Damping Properties of Carbon Laminates by Flax Fiber Hybridization* Jonas John	23 *Numerical investigations on small-scale rotor configurations with validation using acoustic wind tunnel data* Jianping Yin
10:00 - 10:30		50 *Analytical framework for the electrification of a light rotorcraft for Urban Aia Mobility* Francesco Mazzeo	75 *Investigating Power Benefits for a Helicopter by Variation of the Anti-Torque Device* Maximilian Mindt	63 *Modelling of Atmospheric Turbulence in In-House Rotorcraft Simulation Tool: Characterization and Comparison* Cenk Cetin	108 *Experimental Investigation of Tensile Properties of Flax Fiber Composites* Lukas Gaugelhofer	74 *Design Methodology of Urban Air Mobility for Noise Mitigation at Conceptual Design Stage Using Reduced Order Model* Hojin Kim
10:30 - 11:00	Foyer	Coffee Break				

ERF Programme Information:

	Session	Aerodynamics V	Aircraft Design VI	Safety and Operations I	Structures and Materials II	Acoustics II
	Room	TN E0.54	TN E0.46	TS O1.43	TN E0.58	TS 01.40
	Chairperson	Klausdieter Pahlke	Luca Medici	Sebastian Topczewski	Giuseppe Quaranta	Arnaud Le Pape
11:30 - 12:00		105 *Development and Validation of a Fast Mid-Fidelity Comprehensive Analysis Tool for Generic E-VTOL Configurations* Murat Senipek	90 *Numerical Investigation and Design Exploration on Aerodynamic Performance for Stacked Rotor* Yoonpyo Hong	84 *Safety Landing Strategy Investigation for Urban-Air-Mobility Vehicles Using Inverse Simulation Approach* Ye Yuan	115 *Novel High-Performance Composite Materials Development for Vertical Lift* Andrew Makeev	81 *Fully FEM-based simulation approach for advanced helicopter interior noise design using noise sources extracted from flight test data* Stadlmair Nicolai
12:00 - 12:30		117 *Aerodynamic Predictions of the Ship-Helicopter Dynamic Interface with a Dual-Solver Hybrid CFD Methodology* Alex Moushegian	100 *Next Generation Civil Tilt-Rotor Technology Demonstrator (NGCTR-TD) Tail Design* Matteo Pecoraro	92 *Toward Smart Air Mobility: Control System Design and Experimental Validation for an Unmanned Light Helicopter* Emanuele Luigi de Angelis	125 *Manufacturing of a variable chord extension concept for helicopter rotor blades with a flexible EPDM skin* Kalow Steffen	95 *Directivity and Psychoacoustics Focused Multi-Objective Detectability Optimisation for Low Noise Rotorcraft Trajectories* Bianca Erwee
12:30 - 13:30	Foyer	Networking lunch				
	Session	Aerodynamics VI	Aircraft Design VII	Crew Station and Human Factors	Safety and Operations II	Acoustics III
	Room	TN E0.54	TN E0.46	TS O1.43	TN E0.58	TS 01.40
	Chairperson	Marcello Righi	Pierangelo Masarati	Luca Medici	Pierluigi Capone	Klausdieter Pahlke

ERF Programme Information:

13:30 - 14:00		129 *Are eVTOL Aircraft Inherently More Susceptible to the Vortex Ring State Than Conventional Helicopters?* Richard Brown	123 *Hover Performance Predictions of Coaxial Rotor Configurations Using the Updated CMTSVT Multirotor Inflow Model* Feyyaz Güner	87 *Evaluation of a head-mounted display and advanced flight control laws for helicopter ship deck landing* Malte-Jörn Maibach	67 *Path Planning for Innovative Solutions Based on UAV-Helicopter Cooperation in HEMS Missions* Francesca Roncolini	116 *Evaluation of Acoustic Snapshot Arrays for Rotorcraft Source Noise Characterization* James Stephenson
14:00 - 14:30		130 *JAXA-ONERA-DLR Cooperation: Results from Rotor Optimization in Forward Flight* Keita Kimura	126 *Generic eVTOL Aircraft Preliminary Sizing Method for AAM/UAM Missions* Yasir Mahmood Khan	111 *Operator State Monitoring for Workload Prediction and Management* Martine Godfroy-Cooper	83 *Unsteadiness of the rotor slipstream in the ground effect and its impact on helipad loads* Pawel Ruchala	
15:00 - 15:30		131 *Aerodynamics of Small Rotors in Hover and Forward Flight* Felix Lößle	132 *A Simplified Model for Evaluating eVTOL Conceptual Designs and with Example Results for Three Types of eVTOL Aircraft Configurations* Shawn Lim			
15:30 - 16:00	Foyer	Coffee Break				
	Session	Aerodynamics VII				
	Room	TN E0.54				
	Chairperson	Klausdieter Pahlke				

ERF Programme Information:

16:00 - 16:30		138 *CFD Based Positioning and Calibration of Helicopter Air Data System* Murat Senipek				
16:30 - 17:00		134 *The Influence of Rotor/Wing Aerodynamic Interaction of Compound Helicopter in Forward Flights on Wing-body* Yusuke Hamamoto				

ERF Programme Information:

Friday, September 7th, 2022: (optional)

Time:	Where:	Subject:
08:45	ZHAW	Meeting Time for Technical Tour
09:00	ZHAW	Departure for Technical Tour (First REGA, then VRMotion)
10:00 - 12:00	**Zurich Airport**	**Technical Visit: REGA (Swiss Air Rescue)**
10:00 - 12:00	**Dubendorf**	**Technical Visit: VRMotion**
12:15	VR Motion	p/u VRMotion visitors / drive back to Winterthur via REGA
12:30	REGA	p/u REGA visitors / drive back to Winterthur