

43rd European Rotorcraft Forum (ERF 2017)

Milan, Italy
12 - 15 September 2017

Volume 1 of 2

ISBN: 978-1-5108-6538-9

Printed from e-media with permission by:

Curran Associates, Inc.
57 Morehouse Lane
Red Hook, NY 12571



Some format issues inherent in the e-media version may also appear in this print version.

Copyright© (2017) by Associazione Italiana di Aeronautica e Astronautica (AIDAA)
All rights reserved.

Printed by Curran Associates, Inc. (2018)

For permission requests, please contact Associazione Italiana di Aeronautica e Astronautica (AIDAA)
at the address below.

Associazione Italiana di Aeronautica e Astronautica (AIDAA)
Casella Postale 227
00187 Roma V.R.
Italy

Phone: +39 06 88346460

info@aidaa.it

Additional copies of this publication are available from:

Curran Associates, Inc.
57 Morehouse Lane
Red Hook, NY 12571 USA
Phone: 845-758-0400
Fax: 845-758-2633
Email: curran@proceedings.com
Web: www.proceedings.com

TABLE OF CONTENTS

VOLUME 1

AERODYNAMICS

OPTIMAL PLACEMENT OF AN AIRFLOW WIND MEASUREMENTS	1
<i>Molter Christian</i>	
CFD ANALYSIS DURING THE DESIGN OF FUEL EQUIPMENT	14
<i>Robin Marine</i>	
MEASUREMENTS ON A YAWED MODEL ROTOR BLADE PITCHING IN REVERSE FLOW	24
<i>Smith Luke</i>	
FLOWFIELD MEASUREMENTS OF REVERSE FLOW ON A HIGH ADVANCE RATIO ROTOR	38
<i>Lind Andrew</i>	
A NOVEL HYBRID METHOD FOR HELICOPTER COST EFFECTIVE AEROELASTIC SIMULATIONS	53
<i>Riziotis Vasilis</i>	
ASSESSMENT OF LAMINAR-TURBULENT TRANSITION MODELING METHODS FOR THE PREDICTION OF HELICOPTER ROTOR PERFORMANCE	67
<i>Richez Francois</i>	
TOWARDS HIGH-ORDER METHODS FOR ROTORCRAFT APPLICATIONS	77
<i>Barakos George</i>	
AEROELASTIC SIMULATION OF THE TAIL SHAKE PHENOMENON	93
<i>Schaferlein Ulrich</i>	
INVESTIGATION OF DYNAMIC STALL ON A ROTOR WITH CYCLIC PITCH CONTROL	113
<i>Letzger Johannes</i>	
PERFORMANCE PREDICTION OF NOVEL HIGH EFFICIENCY COAXIAL ROTOR CONFIGURATION WITH DISSIMILAR ROTORS	126
<i>Ramanujam Rahul</i>	
LARGE EDDY SIMULATION OF ADVANCING ROTOR FOR NEAR TO FAR WAKE ASSESSMENT	139
<i>Caprace Denis-Gabriel</i>	
PREDICTING AERODYNAMIC PERFORMANCE OF A HOVERING ROTOR NEAR STALL	N/A
<i>Sheng Chunhua</i>	
EXPERIMENTAL EVALUATION OF AN ACTIVE CONTROLLED L-SHAPED TAB FOR DYNAMIC STALL ALLEVIATION	152
<i>Zanotti Alex</i>	
INFLUENCE OF AN ACTIVE GURNEY FLAP UPON THE AERODYNAMIC AND PERFORMANCE PROPERTIES OF A MAIN ROTOR IN VARIOUS STATES OF HELICOPTER FLIGHT	160
<i>Stalewski Wienczyslaw</i>	
REFINED MEASUREMENT AND VALIDATION OF PERFORMANCE AND LOADS OF A MACH-SCALED ROTOR AT HIGH ADVANCE RATIOS	173
<i>Trollinger Lauren</i>	
HELICOPTER FUSELAGE MODEL DRAG REDUCTION BY ACTIVE FLOW CONTROL SYSTEMS	188
<i>De Gregorio Fabrizio</i>	
VALIDATION OF CFD CODES FOR THE HELICOPTER WAKE IN GROUND EFFECT	201
<i>Sugiura Masahiko</i>	
INVESTIGATION OF THE BLADE TIP VORTEX ON A ROTATING AND PITCHING BLADE	213
<i>Goertler Andreas</i>	
TRAILED CIRCULATION OF HOVERING ROTORS WITH LEADING-EDGE PROTUBERANCES	229
<i>Cully Brian</i>	

AIRWORTHINESS

HARMONIZATION ACROSS THE ATLANTIC OF GUIDANCE MATERIAL RELATED TO DIGITAL SYSTEMS ASPECT OF CERTIFICATION	N/A
<i>Fabre Louis</i>	
FROM OPERATIONAL CONSIDERATIONS TO AIRWORTHINESS REQUIREMENTS: AN OFFSHORE APPROACH EXAMPLE	N/A
<i>Smerals Alexandros</i>	
IMPLEMENTATION OF THE HEALTH MONITORING DATA FOR ROTORCRAFT FATIGUE SPECTRUM	240
<i>Rustici Sara</i>	

AERODYNAMICS

FORCES ON OBSTACLES IN ROTOR WAKE - A GARTEUR ACTION GROUP	252
<i>Visingardi Antonio</i>	

SIMULATION OF HELICOPTER AERODYNAMICS IN THE VICINITY OF AN OBSTACLE USING A FREE WAKE PANEL METHOD	266
<i>Schmid Matthias</i>	
ROTORCRAFT FLIGHT IN INTERACTION WITH OBSTACLES	280
<i>Riziotis Vasilis</i>	
HELICOPTER-OBSTACLE AERODYNAMIC INTERACTION IN WINDY CONDITIONS	293
<i>Zagaglia Daniele</i>	
EXPERIMENTAL AND NUMERICAL INVESTIGATION OF THE AERODYNAMIC INTERACTIONS BETWEEN A HOVERING HELICOPTER AND SURROUNDING OBSTACLES	302
<i>Gallas Quentin</i>	
SIMULATION OF UNSTEADY AERODYNAMIC LOAD FOR RIGID COAXIAL ROTOR IN FORWARD FLIGHT WITH VORTEX PARTICLE METHOD	308
<i>Jianfeng Tan</i>	

FLIGHT MECHANICS

SYSTEM IDENTIFICATIONS OF THREE-AXIS GYRO MODEL AND BASE MODEL OF A RC HELICOPTER WITHOUT STABILIZER BAR	320
<i>Wu Mei-Li-Wen</i>	
DYNAMIC INFLOW AND GROUND EFFECT IN MULTIROTOR UAV ATTITUDE DYNAMICS	327
<i>Riccardi Fabio</i>	
RELIABILITY ASSESSMENT OF SMALL-SCALE ROTORCRAFT MODELS	N/A
<i>Avanzini Giulio</i>	
FINITE-STATE WAKE INFLOW MODELS FOR ROTORCRAFT FLIGHT DYNAMICS IN GROUND EFFECT	339
<i>Cardito Felice</i>	
VALIDATION OF A DYNAMIC INFLOW MODEL BASED ON A FLIGHT DYNAMICS MODEL AND A LATTICE-BOLTZMANN FLUID SOLVER USING FLIGHT TEST DATA	348
<i>Bludau Jakob</i>	
THE ROLE OF BLACK-BOX MODELS IN ROTORCRAFT ATTITUDE CONTROL	360
<i>Cortigiani Nicola</i>	
DEVELOPING AN OBSERVATION METHODOLOGY FOR NON-MEASURABLE ROTORCRAFT STATES	370
<i>Trainelli Lorenzo</i>	
ROTORCRAFT MODEL IDENTIFICATION: A BLACK-BOX TIME/FREQUENCY DOMAIN APPROACH	380
<i>Bergamasco Marco</i>	
USE OF HARMONIC DECOMPOSITION MODELS IN ROTORCRAFT FLIGHT CONTROL DESIGN FOR ALLEVIATION OF VIBRATORY LOADS	391
<i>Saetti Umberto</i>	
AW169 TAIL ROTOR LOSS SIMULATION	401
<i>Bianco Mengotti Riccardo</i>	
STABILIZATION OF EXTERNAL LOADS ON A ROTORCRAFT IN HIGH SPEED FLIGHT USING AN ACTIVE CARGO HOOK	414
<i>Singh Ajay</i>	
SIMULATION OF TILTROTOR MANEUVERS USING LINEAR PARAMETER VARYING MODELS	428
<i>Muscarello Vincenzo</i>	
DEVELOPMENT OF AUGMENTED CONTROL LAWS FOR A TILTROTOR IN LOW AND HIGH SPEED FLIGHT MODES	438
<i>Viganò Luca</i>	
ATMOSPHERIC TURBULENCE ESTIMATION FOR HELICOPTER FCS DESIGN	452
<i>Cortigiani Nicola</i>	
DISTRIBUTED TURBULENCE MODEL WITH ACCURATE SPATIAL CORRELATIONS FOR HELICOPTER HANDLING QUALITY ANALYSIS	460
<i>Chen Renliang</i>	
ADAPTIVE CONTROL BASED FLYING QUALITY DESIGN FOR HELICOPTERS	474
<i>Wu Wei</i>	
A MODEL-BASED DESIGN FRAMEWORK FOR ROTORCRAFT TRIM CONTROL LAWS	487
<i>Trainelli Lorenzo</i>	
ABOUT THE IMPACT OF WIND ENERGY WAKE VORTICES ON HELICOPTER TRIM AND ROTOR BLADE MOTION	502
<i>van der Wall Berend G.</i>	
KC/CTI GEOMETRICAL MANAGEMENT DURING INDUSTRIALIZATION (MAP)	520
<i>Gatti Jean-Loup</i>	
FIRST ATTEMPTS TO ACCOUNT FOR FLEXIBLE MODES IN ACT/FHS SYSTEM IDENTIFICATION	531
<i>Seher-Weiss Susanne</i>	
EVALUATION OF OPTIMAL MODEL FOLLOWING CONTROLLERS IN TERMS OF HANDLING QUALITIES	541
<i>Okcu Ilgaz</i>	

MISSION - LEONARDO HELICOPTERS INTEGRATED PERFORMANCE SIMULATION: CONSOLIDATING DECADES OF LESSONS LEARNT AND KEEPING THE DOOR OPEN TO THE LESSONS TO BE LEARNT	551
<i>Bianco Mengotti Riccardo</i>	
MODELING PILOT PULSE CONTROL	561
<i>Bachelder Edward</i>	

AVIONICS & SENSORS

ADVANCED PILOT ASSISTANCE TO PERFORM OIL RIG APPROACHES	578
<i>Canale Nicolas</i>	
AEOLUS FLIGHT MANAGEMENT SYSTEM - DIFFERENTIAL GPS LANDING SYSTEM: AN INSTANT- ON, TACTICAL AND PRECISION APPROACH CAPABILITY	591
<i>Ferraro Davide</i>	
FIRST RESULTS OF LIDAR AIDED HELICOPTER APPROACHES DURING NATO DVE-MITIGATION TRIALS	596
<i>Zimmermann Michael</i>	
HELICOPTER AUTOPILOT FLY-AWAY MODE AFTER LOSS OF ENGINE	610
<i>Zaccuri Rocco Cristian</i>	
ELECTRONIC COUPLED ACTIVE SIDESTICKS IN DUAL PILOT HELICOPTERS FOR INSTRUCTIONAL FLIGHTS	620
<i>dos Santos Sampaio Rodolfo</i>	

SIMULATION & TRAINING

PILOT MODELLING FOR BOUNDARY HAZARD PERCEPTION AND REACTION STUDY	640
<i>Lu Linghai</i>	
WIND CHARACTERIZATION AROUND OFFSHORE PLATFORM FOR REAL-TIME HELICOPTER SIMULATOR	653
<i>Scala Stefano</i>	
THE DEVELOPMENT AND USE OF A PILOTED FLIGHT SIMULATION ENVIRONMENT FOR ROTARY- WING OPERATION TO THE QUEEN ELIZABETH CLASS AIRCRAFT CARRIERS	659
<i>Kelly Michael</i>	
REAL TIMEWAKE COMPUTATIONS USING LATTICE BOLTZMANN METHOD ON MANY INTEGRATED CORE PROCESSORS	670
<i>Barakos George</i>	
REAL-TIME PILOTED SIMULATION USING ROTORCRAFT COMPREHENSIVE ANALYSIS WITH A VIRTUAL REALITY INTERFACE	683
<i>Sridharan Ananth</i>	
QUASI-TRANSFER OF HELICOPTER TRAINING FROM FIXED- TO MOTION-BASE SIMULATOR	696
<i>Fabbroni Davide</i>	
A NUMERICAL MODEL-BASED APPROACH FOR HELICOPTER HARSH LANDING IDENTIFICATION	N/A
<i>Sbarufatti Claudio</i>	
USING PILOTED SIMULATION TO MEASURE PILOT WORKLOAD OF LANDING A HELICOPTER ON A SMALL SHIP	704
<i>Owen Ieuan</i>	

OPERATIONAL ASPECTS

IMPROVE HEMS SERVICE THROUGH PBN ROUTES BASED ON GNSS ONLY	714
<i>Avi Arrigo</i>	
ON THE ESTABLISHMENT OF CLASS 2 HELIPAD TAKEOFF AND LANDING PERFORMANCE FOR THE BK117 C-2: A COMPREHENSIVE APPROACH BASED ON LIMITED TESTING AND SIMULATION	719
<i>Garavello Andrea</i>	
HELICOPTER WAKE ENCOUNTERS IN THE CONTEXT OF RECAT-EU	735
<i>Barakos George</i>	

DYNAMICS

A LTI/LQE SCHEME FOR REAL TIME ROTOR COMPONENT LOAD ESTIMATION	751
<i>Prasad JVR</i>	
ROTOR STATE EVALUATION AND STRUCTURAL HEALTH MONITORING THROUGH STRAIN SENSORS	761
<i>Serafini Jacopo</i>	

MOVING TOWARDS A-PRIORI IDENTIFICATION OF UNDESIRABLE PILOT BIOMETRICS FOR COLLECTIVE BOUNCE INSTABILITY	773
<i>Zanoni Andrea</i>	

VOLUME 2

PERFORMANCE AND VIBRATION ANALYSES OF LIFT-OFFSET HELICOPTERS USING A RIGID COAXIAL ROTOR	788
<i>Park Jae-Sang</i>	

ACOUSTICS

ANALYSIS OF THE FLOW PRODUCED BY A LOW-REYNOLDS ROTOR OPTIMIZED FOR LOW NOISE APPLICATIONS. PART II: ACOUSTICS	799
<i>Serre Ronan</i>	
ASSESSMENT OF A COMPREHENSIVE AERO ACOUSTO-ELASTIC SOLVER FOR ROTORS IN BVI CONDITIONS	806
<i>Serafini Jacopo</i>	
APPLICATION OF LATTICEBOLTZMANN METHOD FOR ROTORCRAFT AERODYNAMICS AND AEROACOUSTICS PREDICTION	816
<i>Romani Gianluca</i>	
A NEW GRID BASED METHOD FOR GENERAL LONG-RANGE ROTORCRAFT ACOUSTICS	N/A
<i>Chitta Subha</i>	

DYNAMICS

EFFECT OF THREE DIMENSIONAL DYNAMIC STALL ON ROTORCRAFT STABILITY	829
<i>Ramanujan Vellingiri</i>	
FLIGHT DYNAMICS OF A MARS HELICOPTER	836
<i>Grip Havard Fjaer</i>	
WHIRL AND STALL FLUTTER SIMULATION USING CFD	850
<i>Barakos George</i>	

ACOUSTICS

NUMERICAL SIMULATION OF ROTOR AERODYNAMICS AND ACOUSTICS USING HIGH-ACCURACY SCHEMES ON UNSTRUCTURED MESHES	N/A
<i>Bobkov Vladimir</i>	
COMPUTATIONAL AEROACOUSTIC ANALYSIS OF PROPELLER INSTALLATION EFFECTS	862
<i>Barakos George</i>	
ACOUSTICAL METHODS AND EXPERIMENTS FOR STUDYING ROTORCRAFT FUSELAGE SCATTERING	879
<i>Yin Jianping</i>	
AN EMISSION SURFACE APPROACH FOR NOISE PROPAGATION FROM HIGH SPEED SOURCES	896
<i>Vigevano Luigi</i>	
EXAMINATION OF THE INFLUENCE OF EMPIRIC PARAMETERS ON THE AEROACOUSTIC RESULTS OF THE FREE WAKE CODE FIRST	910
<i>Kranzinger Patrick</i>	
ANALYSIS OF THE FLOW PRODUCED BY A LOW-REYNOLDS ROTOR OPTIMIZED FOR LOW NOISE APPLICATIONS. PART I: AERODYNAMICS	924
<i>Gourdain Nicolas</i>	

AIRCRAFT DESIGN

THE OVERVIEW OF NEW CARBON PROPELLER DEVELOPMENT FOR 32KG GROSS WEIGHT AGRICULTURAL MULTICOPTER(OCTOCOPTER)	937
<i>Kim Deog-Kwan</i>	
AN ENHANCED PREDICTION METHODOLOGY FOR RAPID PERFORMANCE AND CONTROL DESIGN OF HIGHLY MANEUVERABLE UAVS	947
<i>Smith Marilyn</i>	
PERFORMANCE IMPROVEMENT OF VARIABLE SPEED ROTORS BY GURNEY FLAPS	961
<i>Han Dong</i>	
A MULTIDISCIPLINARY PROCESS FOR INTEGRATED ROTORCRAFT DESIGN	974
<i>Weiland Peter</i>	
CLEAN SKY 2: EXPLORING NEW ROTORCRAFT HIGH SPEED CONFIGURATIONS	989
<i>Cabrit Philippe</i>	

STATIC AEROELASTIC RESPONSE OF ROTOR BLADE UNDER INTERNAL AXIAL LOADING	1001
<i>Dibble Robert</i>	
INTEGRATION OF PHYSICS BASED WEIGHT MODELS INTO ROTORCRAFT DESIGN SIZING	1011
<i>Govindarajan Bharath</i>	
ON THE ANALYSES OF ROTORCRAFT DYNAMICS AND RAPID AERODYNAMIC LOADS ESTIMATION FOR FLIGHT CONTROL ACTUATION	N/A
<i>Hashim Farahani</i>	

AIRCRAFT SYSTEMS

CONDITION MONITORING ON HYDRAULIC PUMPS – LESSONS LEARNT	1025
<i>Paulmann Gregor</i>	
AUTOMATIC TEMPERATURE CONTROL OF A HYDRAULIC SYSTEM VIA STEPPED PRESSURE MODULATION, A DUAL STAGE VALVE OPTIMIZATION	1042
<i>Bacchiega Giacomo</i>	
ADVANCES IN HELICOPTER ELECTRIC TAIL ROTOR DRIVE	1054
<i>Brunetti Massimo</i>	
AUTOPILOT DESIGN FOR THE ERICA TILT-ROTORCRAFT	N/A
<i>Sollazzo Adolfo</i>	
HELICOPTER VIBRATION HEALTH MONITORING SYSTEMS FEATURING ENGINE VIBRATION MONITORING	1067
<i>Bendisich Stefan</i>	

ENGINES & PROPULSION

HELICOPTER TURBOSHAFT ENGINE: THE SPECIFICITIES TO MEET AIRFRAMER REQUIREMENTS AND CUSTOMER NEEDS	1077
<i>Ripolles Frederic</i>	
LIGHT HELICOPTER DEMONSTRATOR WITH HIGH COMPRESSION ENGINE (HCE): FLIGHT TESTS RESULTS	1090
<i>Mercier Christian</i>	
ANALYSIS METHOD FOR OPTIMAL DESIGN OF HELICOPTER MAIN GEARBOX WITH COMBINATION OF STRUCTURAL AND THERMAL INFLUENCE	1101
<i>Park Youn</i>	
ANALYSIS OF A HELICOPTER MAIN GEARBOX BY MEANS OF NUMERICAL MODELLING APPROACH	1113
<i>Manes Andrea</i>	
COMPOUND-SPLIT DRIVETRAINS FOR ROTORCRAFT	1127
<i>Paschinger Pierre</i>	
CONCEPTUAL AND PRELIMINARY DESIGN OF A HYBRID DUST FILTER FOR HELICOPTER ENGINES	1142
<i>Bojdo Nicholas</i>	

STRUCTURES & MATERIALS

HEALTH STRUCTURE MONITORING FOR AIRCRAFT AND ROTORCRAFT THROUGH INVERSE FINITE ELEMENT METHOD (IFEM)	1156
<i>Papa Umberto</i>	
INTERLAMINAR DAMAGE DETECTION IN COMPOSITE ELEMENTS BY MEANS OF OPTICAL FIBRE SENSORS	1172
<i>Bettini Paolo</i>	
MULTIFIELD VARIATIONAL SECTIONAL ANALYSIS FOR COMPOSITE BLADES BASED ON GENERALIZED TIMOSHENKO-VLASOV THEORY	1186
<i>Jung Sung</i>	
BASIC AEROELASTIC STABILITY STUDIES OF HINGELESS ROTOR BLADES IN HOVER USING GEOMETRICALLY EXACT BEAM AND FINITE-STATE INFLOW	1195
<i>Amoozgar Mohammadreza</i>	
A STRESS BASED CRITICAL-PLANE APPROACH FOR STUDY OF ROLLING CONTACT FATIGUE CRACK PROPAGATION IN PLANET GEARS	1203
<i>Pierre Depouhon</i>	
FATIGUE SUBSTANTIATION AND DAMAGE TOLERANCE EVALUATION OF ROTORCRAFT HORIZONTAL TAIL	1211
<i>Kumar R. Vijaya</i>	
VISCOELASTIC SHEAR DAMPING MECHANISM FOR VIBRATION REDUCTION ON A HELICOPTER ANTI TORQUE BEAM	1219
<i>Bottasso Luigi</i>	
STRUCTURAL TEST RIG DESIGN OPTIMISATION	N/A
<i>Smith Drew</i>	

HELICOPTER AND AIRPLANE CUSTOM SHIELDING SOLUTIONS WITH ELECTRONICALLY CONDUCTIVE FABRICS IN CONJUNCTION WITH KEVLAR OR CARBON TEXTILE IN ALTERNATIVE TO COPPER OR ALUMINUM MESH	1231
<i>Soliani Ivano</i>	

DYNAMICS

USING MULTIBODY DYNAMICS FOR THE STABILITY ASSESSMENT OF A NEW ROTOR TEST RIG	1238
<i>Arnold Juergen</i>	
IMPROVEMENT OF WHIRL FLUTTER STABILITY OF TILTROTOR USING GURNEY FLAPS	N/A
<i>Quaranta Giuseppe</i>	
NONLINEAR STABILITY ANALYSIS OF WHIRL FLUTTER FOR A TILTROTOR WING-NACELLE SYSTEM	1248
<i>Rezgui Djamel</i>	
AEROMECHANICS OF SELF-TWISTING BLADES IN HIGH-SPEED SLOWED ROTOR FLIGHT	1259
<i>Ward Elizabeth</i>	
VIBRATORY LOAD PREDICTIONS OF A HIGH-ADVANCE RATIO COAXIAL ROTOR SYSTEM VALIDATED BY WIND TUNNEL TESTS	1277
<i>Feil Roland</i>	
A VIRTUAL ENVIRONMENT FOR ROTORCRAFT VIBRATION ANALYSIS	1294
<i>Tamer Aykut</i>	
INDIVIDUAL BLADE CONTROL WITH THE SMART SPRING - A CLOSEDLOOP INDEPENDENT HARMONIC CONTROL APPROACH	1307
<i>Nitzsche Fred</i>	
PHYSICS BASED APPROACHES FOR ACTIVE ROTOR MODELING AND CONTROL	1317
<i>Sankar Lakshmi</i>	

TEST & EVALUATION

A NEED TO REWRITE THE TAKEOFF AND LANDING ACCEPTABLE COMPLIANCE METHODS (AMC/AC 27&29) FOR MULTIENGINE ROTORCRAFTS	1331
<i>Paggi Bernardino</i>	
DEGRADED VISUAL ENVIRONMENT MITIGATION (DVE-M) PROGRAM NATO FLIGHT TRIALS: U.S. ARMY FLIGHT TEST AND RESULTS	1347
<i>Fujizawa Brian</i>	
SHIP/HELICOPTER QUALIFICATION TESTING FOR A NON-NAVAL HELICOPTER	1360
<i>Ciotola Antonio</i>	
LIVE OPTICAL DIGITIZATION OF FLIGHT INSTRUMENTS FOR FLIGHT GUIDANCE IN HELICOPTER NOISE MEASUREMENTS	1371
<i>Timmerman Bart</i>	
INDIVIDUAL BLADE CONTROL OF A 5-BLADED ROTOR USING THE MULTIPLE SWASHPLATE SYSTEM	1380
<i>Kuefmann Philip</i>	
CONTROL DESIGN OF A TILTING MECHANISM FOR THE UK NATIONAL ROTOR TEST RIG FACILITY	1397
<i>Morales-Viviescas Rafael</i>	
EXPERIMENTAL ASSESSMENT OF TILTROTOR AIR INTAKE DUCT SHAPE OPTIMIZATION	1406
<i>Gibertini Giuseppe</i>	

HISTORY OF ROTORCRAFT

ENRICO FORLANINI'S CONTRIBUTION TO FIXED AND ROTARY WING AIRCRAFT DEVELOPMENT	1414
<i>Cardani Cesare</i>	
THE ENGINEER LEONARDO AND THE LEONARDO ENGINEER: DESIGNING ROTORCRAFTS UNDER HIS NAME FIVE CENTURIES LATER	1422
<i>Bianco-Mengotti Riccardo</i>	
EARLY DEVELOPMENT OF TILTROTOR CONVERTIBLE AIRCRAFT IN THE UNITED KINGDOM	N/A
<i>D'Andrea Andrea</i>	
UNBUILT PROTOTYPES FROM AGUSTA EARLY YEARS (1956-1970)	N/A
<i>Ricci Moretti Luigi</i>	

CREW STATION & HUMAN FACTORS

INTEGRATING DATA AND SENSOR BASED OBSTACLE INFORMATION IN A CONFORMAL LANDING DISPLAY FOR HELICOPTER	N/A
<i>Lueken Thomas</i>	

PHYSIOLOGICAL AND PSYCHOLOGICAL RESPONSE MODELLING OF THE HELICOPTER PILOT THROUGH VIBRATION SIMULATION	1441
<i>Khaksar Zeinab</i>	
WORKLOAD REDUCTION THROUGH STEERING WHEEL CONTROL FOR ROTORCRAFT	1447
<i>Schuchardt Bianca I.</i>	

TEST & EVALUATION

EXPERIMENTAL VALIDATION OF A FLUIDIC PITCH LINK MODEL	1455
<i>Treacy Shawn</i>	
MEASUREMENT OF BLADE DEFLECTIONS OF AN UNMANNED INTERMESHING HELICOPTER	1469
<i>Andreas Voigt</i>	
EXPERIMENTAL INVESTIGATION AND VALIDATION OF STRUCTURAL PROPERTIES OF A NEW DESIGN FOR ACTIVE TWIST ROTOR BLADES	1481
<i>Kalow Steffen</i>	
DESIGN AND MANUFACTURE OF INSTRUMENTED ROTOR BLADES FOR A HELICOPTER TEST RIG	1490
<i>Filippone Antonio</i>	

MANUFACTURING

AUTOMATED INSERTION OF Z-PINS INTO THICK COMPOSITE LAMINATES	N/A
<i>Imperiale Vita</i>	
FTK ROTOR BLADES: DESIGN, MANUFACTURING AND TESTING	1499
<i>Mainz Henning</i>	

ADDITIONAL PAPERS

OPTIMAL CONTROL OF PRETWISTED ADAPTIVE ROTATING BLADES MODELED AS ANISOTROPIC THIN-WALLED BEAM WITH PIEZO-COMPOSITE	1513
<i>Wang Xiao</i>	
ANALYSIS OF A FINITE STATE MULTI-ROTOR DYNAMIC INFLOW MODEL	1524
<i>Prasad JVR</i>	
A NUMERICAL INVESTIGATION OF GROUND EFFECT ON ROTORCRAFT IN THE PRESENCE OF SIDE WALL	1537
<i>Cibin Joseph</i>	
ADVANCED VIBRATION DIAGNOSTIC SYSTEM AT THE PART OF HELICOPTER TECHNICAL MAINTENANCE	1547
<i>Mironov A.</i>	
Author Index	