2020 IEEE 7th International Workshop on Metrology for AeroSpace (MetroAeroSpace 2020)

Pisa, Italy
22 – 24 June 2020

IEEE Catalog Number: CFP2032W-POD
ISBN: 978-1-7281-6637-7

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IEEE Catalog Number:	CFP2032W-POD
ISBN (Print-On-Demand):	978-1-7281-6637-7
ISBN (Online):	978-1-7281-6636-0
ISSN:	2575-7482

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CONFERENCE PROGRAM

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Silvia Liberata Ullo, *University of Sannio, Italy*

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Antonio Pannico, University of Naples 'Federico II', Italy
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Ilaria Papa, University of Naples 'Federico II', Italy
Valentina Lopresto, University of Naples 'Federico II', Italy

351 **External and internal quality inspection of aerospace components**
Carlos Beltran-Gonzalez, Pattern Analysis and Computer Vision Istituto Italiano di Tecnologia, Italy
Matteo Bustreo, Pattern Analysis and Computer Vision Istituto Italiano di Tecnologia, Italy
Alessio Del Bue, Pattern Analysis and Computer Vision Istituto Italiano di Tecnologia, Italy

SESSION 2.5 - GENERAL SESSION - PART 3

Room: Virtual Room #2
Chair: Alice Buffi, *University of Pisa, Italy*

356 **CFD analysis of the "MicroMED" Optical Particle Counter in various planetary environments**
Giuseppe Mongelluzzo, INAF, University of Naples 'Federico II', Italy
Gabriele Franzese, INAF, Italy
Cesare Molfese, INAF, Italy
Francesca Esposito, INAF, Italy
Alan Cosimo Ruggeri, INAF, Italy
Fabio Cozzolino, INAF, Italy
Carmen Porto, INAF, Italy

362 **Time Difference of Arrival for stratospheric balloon tracking: design and development of the STRAINS Experiment**
Luigi di Palo, (DIMA) Sapienza University of Rome, Italy
Riccardo Garofalo, (DIMA) Sapienza University of Rome, Italy
Emanuele Bedetti, (DIMA) Sapienza University of Rome, Italy
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Francesco Iovanna, (DIMA) Sapienza University of Rome, Italy
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Paolo Marzioli, (DIMA) Sapienza University of Rome, Italy
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Angela Volpe, Italian Space Agency, Italy
Federico Curianò, (DIAEE) Sapienza University of Rome, Italy
Fabio Santoni, (DIAEE) Sapienza University of Rome, Italy

367 **Research on single frequency terahertz beam divergence Angle measurement**
Xiaoqiang Gao, Beijing Aerospace Institute for Metrology and Measurement, China
Lin Liu, Beijing Aerospace Institute for Metrology and Measurement, China
Yang Xie, Beijing Aerospace Institute for Metrology and Measurement, China
Hao Liu, Beijing Aerospace Institute for Metrology and Measurement, China
Zongjun Wang, Beijing Aerospace Institute for Metrology and Measurement, China
Xiaoxu Liu, Beijing Aerospace Institute for Metrology and Measurement, China

372 **Comb-calibrated Frequency-modulated Continuouswave Lidar**
Yang Xie, Beijing Aerospace Institute for Metrology and Measurement, China
Tieli Zhang, Beijing Aerospace Institute for Metrology and Measurement, China
Zongjun Wang, Beijing Aerospace Institute for Metrology and Measurement, China
Lin Liu, Beijing Aerospace Institute for Metrology and Measurement, China
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Meng Ge, Beijing Aerospace Institute for Metrology and Measurement, China
Fumin Zhang, Tianjin University, China

SESSION 3.5 - SENSORS AND SOLUTIONS FOR AUTONOMOUS AEROSPACE SYSTEMS - PART 1

Room: Virtual Room #3

Chairs: Domenico Accardo, *University of Naples Federico II, Italy*
Roberto Opromolla, *University of Naples Federico II, Italy*

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Claudia Conte, University of Naples 'Federico II', Italy
Giorgio de Alteriis, University of Naples 'Federico II', Italy
Giancarlo Rufino, University of Naples 'Federico II', Italy
Domenico Accardo, University of Naples 'Federico II', Italy

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387 **Application of dispersed microresonator based sensor for aerospace-related tasks**
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Elina Tcherniavskaia, Belarusian State University, Belarus
Vladimir Saetchnikov, Belarusian State University, Belarus
Andreas Ostendorf, Ruhr University Bochum, Germany

392 **Hazard detection and landing site selection for planetary exploration using LIDAR**
Davide Mango, University of Naples 'Federico II', Italy
Roberto Opromolla, University of Naples 'Federico II', Italy
Christoph Schmitt, Jena-Optronik GmbH, Germany

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Room: Virtual Room #1
Chairs: Vito Pagliarulo, *CNR-ISASI, Italy*
Pietro Ferraro, *CNR-ISASI, Italy*
Ettore Stella, *CNR-STIIMA, Italy*
Nicola Gallo, *Leonardo SpA, Italy*

398 **Comparative analysis of multimodal feature-based 3D point cloud stitching techniques for aeronautic applications**
Vito Renò, National Research Council of Italy, STIIMA, Italy
Massimiliano Nitti, National Research Council of Italy, STIIMA, Italy
Maria di Summa, National Research Council of Italy, STIIMA, Italy
Rosalia Maglietta, National Research Council of Italy, STIIMA, Italy
Ettore Stella, National Research Council of Italy, STIIMA, Italy

403 **A RANSAC-based method for detecting postassembly defects in aircraft interiors**
Nicola Mosca, National Research Council of Italy, STIIMA, Italy
Cosimo Patruno, National Research Council of Italy, STIIMA, Italy
Roberto Colella, National Research Council of Italy, STIIMA, Italy
Simone Pio Negri, National Research Council of Italy, STIIMA, Italy
Ettore Stella, National Research Council of Italy, STIIMA, Italy

409 **Physics-based modelling and optimisation of shimming operations in the assembly process of aircraft skin panels**
Pasquale Franciosa, University of Warwick, UK
Salvatore Gerbino, University of Campania "L. Vanvitelli", Italy
Nicola Gallo, Leonardo SpA, Italy
Massimo Martorelli, University of Naples 'Federico II', Italy

415 **Optical characterizations of airless radial tire**
Massimo Martorelli, University of Naples 'Federico II', Italy
Domenico Speranza, University of Cassino and Southern Lazio, Italy
Pietro Ferraro, CNR National Research Council, Italy
Andrea Genovese, University of Naples 'Federico II', Italy
Antonio Gloria, IPCB, CNR National Research Council, Italy
Vito Pagliarulo, ISASI, CNR National Research Council, Italy

SESSION 2.6 - GARFIELD - GENERAL AVIATION RESEARCH AND DEVELOPMENT. METROLOGY, METHODS AND INSTRUMENTATION

Room: Virtual Room #2
Chair: Jarosław Pytka, *Lublin University of Technology, Lublin, Poland*

420 **Flight Testing of the PROPWING Airplane Propulsion Concept**
Jarosław Pytka, Lublin University of Technology, Poland
Andrzej Rypulak, Military University of Aviation, Poland
Joanna Michałowska, The State School of Higher Education, Poland
Jan Pytka, Military University of Aviation, Poland
Dariusz Błażejczak, West University of Technology in Szczecin, Poland
Ernest Gnapowski, University College of Administration and Enterprise, Poland
Jan Laskowski, Lublin University of Technology, Poland

426 **Wind Tunnel Testing of Mesh Electrodes Plasma Actuator**
Ernest Gnapowski, University College of Enterprise and Administration, Poland
Jarosław Pytka, Lublin University of Technology, Poland
Jerzy Józwik, Lublin University of Technology, Poland
Joanna Michałowska, The State School of Higher Education, Poland

430 **Special measurement standard of mass, mass center and inertia moment**
Olga Dovydenko, TsAGI, Russia
Aleksander Samoylenko, TsAGI, Russia
Vasiliy Petronevich, TsAGI, Russia

436 **Soil Cone Index impact on aircraft ground performance**
Anna Zalewska-Tytłak, Lublin University of Technology, Poland
Tomasz Łyszczyk, Lublin University of Technology, Poland
Jarosław Pytka, Lublin University of Technology, Poland

441 **Uncertainty Estimation of Measuring Circuit During Cutting Forces Measurement Using the Piezoelectric Dynamometer**
Magdalena Zawada-Michałowska, Lublin University of Technology, Poland
Paweł Pieśko, Lublin University of Technology, Poland
Jerzy Józwik, Lublin University of Technology, Poland
Legutko Stanisław, Poznan University of Technology, Poland
Dariusz Mika, The State School of Higher Education, Poland
Jarosław Pytka, Lublin University of Technology, Poland

SESSION 3.6 - SENSORS AND SOLUTIONS FOR AUTONOMOUS AEROSPACE SYSTEMS - PART 2

Room: Virtual Room #3
Chairs: Domenico Accardo, *University of Naples Federico II, Italy*
Giorgio de Alteriis, *University of Naples Federico II, University of Bergamo*

446 **Analysis of LIDAR-based relative navigation performance during close-range rendezvous toward an uncooperative spacecraft**
Alessia Nocerino, University of Naples 'Federico II', Italy
Roberto Opromolla, University of Naples 'Federico II', Italy
Giancarmine Fasano, University of Naples 'Federico II', Italy
Michele Grassi, University of Naples 'Federico II', Italy

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Gabriella Serafino, Leonardo company, Italy
Francesco Tesauri, RE: Lab Srl, Italy
Maurizio Goiak, Leonardo company, Italy
Enrico Lo greco, Leonardo company, Italy
Nicola Toniazzi, Leonardo company, Italy
Paolo Zerbo, Leonardo company, Italy

457 **Use of piezoelectric actuators for thrust vectoring in ion engines: conceptual design and preliminary analysis**
Naveen K. Doddahosahalli Nagarajaiah, University of Pisa, Italy
Guglielmo Neri, University of Pisa, Italy
Arjun Jayaprakash Chaliyath, University of Pisa, Italy
Mario Rosario Chiarelli, University of Pisa, Italy
Gianpietro Di Rito, University of Pisa, Italy

463 **Flying Outfit for Control of Unsafe Seagulls**
Domenico Accardo, University of Naples 'Federico II', Italy
Leopoldo Angrisani, University of Naples 'Federico II', Italy
Luca Borrelli, University of Naples 'Federico II', Italy
Mauro D'Arco, University of Naples 'Federico II', Italy
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Giancarmine Fasano, University of Naples 'Federico II', Italy
Alessandro Fioretti, University of Naples 'Federico II', Italy
Giancarlo Rufino, University of Naples 'Federico II', Italy
Tamara Russo, University of Naples 'Federico II', Italy
Anna Elena Tirri, University of Naples 'Federico II', Italy

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Carlo Bettanini, University of Padova, Italy
P. Fiorentin, University of Padova, Italy
A. Dumitriu, University of Padova, Italy
E. Conte, University of Padova, Italy
F. Accatino, University of Padova, Italy
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N. Magro, University of Padova, Italy
M. Bedendo, University of Padova, Italy
A. Aboudan, University of Padova, Italy
G. Colombatti, University of Padova, Italy

SESSION 1.7 - STRUCTURAL HEALTH MONITORING AND NONDESTRUCTIVE TESTING FOR AEROSPACE

Room: Virtual Room #1
Chairs: Marco Laracca, *Univerity of Cassino, Italy*
Leandro Maio, *University of Naples 'Federico II', Italy*
Vittorio Memmolo, *University of Naples 'Federico II', Italy*

475 **High Quality Process of Ultrasonic Nondestructive Testing of Adhesively Bonded Dissimilar Materials**
Damira Smagulova, Kaunas University of Technology, Lithuania
Elena Jasiuniene, Kaunas University of Technology, Lithuania

480 **Analysis of the accuracy in impact localization using piezoelectric sensors for Structural Health Monitoring with multichannel real-time electronics**
Andrea Bulletti, University of Florence, Italy
Eugenio Marino Merlo, University of Florence, Italy
Lorenzo Capineri, University of Florence, Italy

485 **Sensor integration within composite structures for continuous load monitoring**
Vittorio Memmolo, University of Naples 'Federico II', Italy
Matthias Schmidt, Fraunhofer LBF, Germany
Leandro Maio, University of Naples 'Federico II', Italy
Fabrizio Ricci, University of Naples 'Federico II', Italy

491 **On the use of smart on-board systems for aircraft ice removal**
Leandro Maio, University of Naples 'Federico II', Italy
Mena Piscitelli, Italian Aerospace Research Centre, Italy
Salvatore Ameduri, Italian Aerospace Research Centre, Italy
Angela Brindisi, Italian Aerospace Research Centre, Italy
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Fabrizio Ricci, University of Naples 'Federico II', Italy
Concilio Antonio, Italian Aerospace Research Centre, Italy
Marco Laracca, University of Cassino and Southern Lazio, Italy

496 **Preliminary results of FMCW radar measurements at 60GHz for ice build up detection on the surface of a composite panel**
Leandro Maio, University of Naples 'Federico II', Italy
Jochen Moll, Goethe-University Frankfurt, Germany

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Room: Virtual Room #2
Chair: Fabio Leccese, *Roma Tre University, Italy*

500 **Inertial Navigation Systems (INS) for Drones: Position Errors Model**
Enrico Petritoli, Università degli Studi "Roma Tre", Italy
Fabio Leccese, Università degli Studi "Roma Tre", Italy
Giuseppe Schirripa Spagnolo, Università degli Studi "Roma Tre", Italy

505 **Post-annealing effects on stability of lasered nanostructured ZnO sensors for their usage in monitoring smart greenhouse**
Luca Maiolo, IMM-CNR, Italy
Francesco Maita, IMM-CNR, Italy
Ivano Lucarini, IMM-CNR, Italy
Annalisa Convertino, IMM-CNR, Italy
Davide Polese, IMM-CNR, Italy

510 **General Reliability Assessment via the Physics-Based Approach**
Anna Paggi, ItalConsul s.r.l., Italy
Gian Luca Mariotti, ItalConsul s.r.l., Italy
Roberto Paggi, ItalConsul s.r.l., Italy
Fabio Leccese, Università degli Studi "Roma Tre", Italy

516 **CO_2 Recycling into Methane and Water over Stable Selective Catalyst Ni/CeO_2-nanorods**
Simonetta Tuti, "Roma Tre" University, Italy
Igor Luisetto, ENEA, Italy
Fabio Leccese, "Roma Tre" University, Italy
Eleonora Marconi, "Roma Tre" University, Italy
Sergio Lo Mastro, "Roma Tre" University, Italy
Elisabetta Di Bartolomeo, "Tor Vergata" University, Italy
Mariarita Santoro, "Tor Vergata" University, Italy

522 **Simulation of a WSN Routing Protocol for Airport Runway Application**
Marco Cagnetti, Università degli Studi "Roma Tre", Italy
Mariagrazia Leccisi, Università degli Studi "Roma Tre", Italy
Fabio Leccese, Università degli Studi "Roma Tre", Italy

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Sabino Giarnetti, SeTeL s.r.l., Italy
Eduardo De Francesco, SeTeL s.r.l., Italy
Ruggero De Francesco, SeTeL s.r.l., Italy
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SESSION 3.7 - SENSORS AND SOLUTIONS FOR AUTONOMOUS AEROSPACE SYSTEMS - PART 3

Room: Virtual Room #3
Chairs: Domenico Accardo, *University of Naples Federico II, Italy*
Claudia Conte, *University of Naples Federico II, University of Bergamo*

534 **Use of Consumer-Grade MEMS Inertial Sensors for Accurate Attitude Determination of Drones**
Giorgio de Alteriis, University of Naples 'Federico II', Italy
Claudia Conte, University of Naples 'Federico II', Italy
Rosario Schiano Lo Moriello, University of Naples 'Federico II', Italy
Domenico Accardo, University of Naples 'Federico II', Italy

539 **Adaptive Detection Tracking System for Autonomous UAV Maritime Patrolling**
Alessandro Panico, Italian Air Force, Italy
Luca Zanotti Fragonara, Cranfield University, UK
Saba Al-Rubaye, Cranfield University, UK

545 **Software and Sensor Issues for Autonomous Systems based on Machine Learning Solutions**
Dario De Dominicis, Italian Airforce Academy, Italy
Domenico Accardo, University of Naples 'Federico II', Italy

550 **Unmanned Aerial Vehicle platform based on low-power components and environmental sensors: technical description and data analysis on real-time monitoring of air pollutants**
Giuseppe Caragnano, LINKS Foundation, Italy
Simone Ciccia, LINKS Foundation, Italy
Fabrizio Bertone, LINKS Foundation, Italy
Giuseppe Varavallo, LINKS Foundation, Italy
Olivier Terzo, LINKS Foundation, Italy
Davide Capello, Novasis Innovazione, Italy
Alberto Brajon, AISICO, Italy

SESSION 1.8 - TERRESTRIAL AND IN-FLIGHT VERIFICATION OF THE GNC SYSTEMS FOR AEROSPACE VEHICLES

Room: Virtual Room #1
Chairs: Yevgeny Somov, *Samara State Technical University, Russia*
Paolo Castaldi, *University of Bologna, Italy*

555 **Ground Facility for Validation of Proximity Operations: a Hardware–In–the–Loop Experiment**
Alex Caon, University of Padova, Italy
Francesco Feltrin, University of Padova, Italy
Francesco Branz, University of Padova, Italy
Francesco Sansone, Stellar Project srl, Italy
Alessandro Francesconi, University of Padova, Italy

561 **Interplanetary Spacecraft Control Methods and Algorithms for Large Cargo Delivery**
Alexander Nebylov, State University of Aerospace Instrumentation (SUAI), Russia
Alexander Panferov, State University of Aerospace Instrumentation (SUAI), Russia
Sergey Brodsky, State University of Aerospace Instrumentation (SUAI), Russia
Boris Birjukov, State University of Aerospace Instrumentation (SUAI), Russia

566 **Checking the Accuracy of Long-term Stabilizing a Spacecraft with a Large-size Asymmetric Elastic Structure in Geostationary Orbit**
Yevgeny Somov, Samara State Technical University, Russia
Sergey Butyrin, Samara State Technical University, Russia
Sergey Somov, Samara State Technical University, Russia

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Alexander Panferov, State University of Aerospace Instrumentation (SUAI), Russia
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Sergey Brodsky, State University of Aerospace Instrumentation (SUAI), Russia

577 **Checking the Accuracy of a Space Robot Control System at Inspecting the State of Geostationary Satellite**
Yevgeny Somov, Samara State Technical University, Russia
Sergey Butyrin, Samara State Technical University, Russia
Sergey Somov, Samara State Technical University, Russia

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Room: Virtual Room #2
Chair: Ioan Tudosa, *University of Sannio, Italy*

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Francesco Picariello, University of Sannio, Italy
Ioan Tudosa, University of Sannio, Italy
Eulalia Balestrieri, University of Sannio, Italy
Sergio Rapuano, University of Sannio, Italy
Luca De Vito, University of Sannio, Italy

588 **Vehicle localization using laser scanner**
Wieslaw Szaj, Rzeszow University of Technology, Poland
Jacek Pieniazek, Rzeszow University of Technology, Poland

594 **Simulation Framework for Mobile Robots in Planetary-Like Environments**
Riccardo Giubilato, CISAS, University of Padova, Italy, Institute of Robotics and Mechatronics, Germany
Andrea Masili, University of Padova, Italy
Sebastiano Chiodini, CISAS, University of Padova, Italy
Marco Pertile, CISAS, University of Padova, Italy
Stefano Debei, CISAS, University of Padova, Italy

600 **A test-bench for battery-motor-propeller assemblies designed for multirotor vehicles**
Giulio Avanzini, Università del Salento, Italy
Attilio Di Nisio, Politecnico di Bari, Italy
Anna Lanzolla, Politecnico di Bari, Italy
Donato Stigliano, Politecnico di Bari, Italy

606 **Uncertainty evaluation for dynamic measurements**
Claudio Fogaça Truyts, Institute Aeronautics and Space, Brazil
M. L. C. C., Reis, Institute Aeronautics and Space, Brazil

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Room: Virtual Room #3
Chairs: Zbigniew Czyż, *Polish Air Force University, Poland*
Jerzy Józwik, *Lublin University of Technology, Poland*
Tomasz Łusiak, *Polish Air Force University, Poland*

610 **Aerodynamic Measurement of the Rotor Blade for Aviation Application**
Ksenia Siadkowska, Lublin University of Technology, Poland

615 **Unmanned Autogyro for Advanced SAR Tasks: a Preliminary Assessment**
Enrico Petritoli, Science Department, Università degli Studi "Roma Tre", Italy
Fabio Leccese, Science Department, Università degli Studi "Roma Tre", Italy

620 **Research into a Fuel Supply System in the Aircraft Diesel Opposed Engine**
Łukasz Grabowski, Lublin University of Technology, Poland
Rafał Sochaczewski, Lublin University of Technology, Poland
Grzegorz Barański, Lublin University of Technology, Poland
Michał Biały, Lublin University of Technology, Poland

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Zbigniew Czyż, Military University of Aviation, Poland
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