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CidB
Centre d'information
sur le Bruit

A
Symposium
on Noise from
UASs/UAVs

QUIET DRONES

19 – 21 October 2020

Paris,
France

an e-Symposium

PROGRAMME Updated 2nd October 2020

Supporting Organisations

This Symposium is organised by INCE/Europe in association with CidB.

It is supported by the
International Institute of Noise Control Engineering

and is endorsed by the
International Commission for Acoustics

and as such it is one of the events in the
International Year of Sound

In France it is supported by
Ministère de la Transition Ecologique et Solidaire,

Direction Générale de l'Aviation Civile (DGAC)

and

ONERA, the French Aerospace Lab.

Sponsoring companies:

To register or become a sponsor : www.quietdrones.org

SESSION 1 : OPENING SESSIONS

Sunday 18th October 18h00-19h30 and Monday 19th October 09h00-10h30

Opening Presentations : *INCE-Europe, CIDB, International-INCE et International Year of Sound*

Opening Presentations :

A summary of the 2018 Workshop on UAS and UAV Noise Emissions and Noise Control Engineering Technology in Washington, DC, National Academy of Engineering.	**Robert Hellweg** (Technology for a Quieter America Workshop Steering Committee)	**USA**
Will Noise become a new Hurdle which could impair the development of Drones	**Carine Donzel** (DGAC) et **Henry de Plinval** (ONERA)	**FRANCE**
Drone Noise, a new public health challenge?	**Antonio Torija Martinez** (University of Salford)	**GREAT BRITAIN**

SESSION 2 : Assessing Noise and Noise Impact on People and Environment

Monday 19th October 16h00-18h00 (session in parallel with session 7)

Session chaired by : Patricia Davies (Purdue University, USA)

European Union legislation on managing noise from drones and e-VTOL	Marco Pavioti (European Commission)	EUROPE
Multi-rotor powered drone noise assessment	Xin Zhang (Hong Kong University of Science & Technology)	CHINA
Aeroacoustic measurements on a free-flying drone in a WindShaper wind tunnel	Roberto Putzu (Univ. Applied Science Geneva)	SWITZER-LAND
Assessment of environmental noise characteristics of innovative aerial vehicles	Raphael Hallez (Siemens Digital Industries Software)	BELGIUM
Towards the Incorporation of Auditory Masking Effects into Assessments of Community Noise	Andrew Christian (NASA Langley Research Center)	USA
Methods for Providing Design Guidance to Improve Drone Sound using Community Input	David Bowen (Acentech)	USA
A whole-systems approach to building knowledge about human reaction to drones	Charlotte Clark (ARUP)	GREAT BRITAIN

Discussion : *Is the impact of drone noise on people different from other noise?*

SESSION 3 : Specific Noise Concerns with Packages and deliveries

Tuesay 20th October 09h00-11h00 (session in parallel with session 8)

Session chaired by : Marion Burgess (UNSW, Australie)
Andy McKenzie (Hayes McKenzie, GB)

Drone delivery and noise regulation in the Australian context	**Marion Burgess** (UNSW)	**AUSTRALIA**
Delivery Drones at La Poste	**Philippe Cassan** (DPD group / La Poste)	**FRANCE**
Commercial Delivery Drone Routing: A Case Study of Noise Impacts	**Eddie Duncan** (RSG)	**USA**
Acceptance of drone delivery is limited (not only) by noise concerns	**Hinnerk Eißfeldt** (DLR German Aerospace Center)	**GERMANY**

Discussion : *Does the Impact on people depend on what is being delivered?*

SESSION 4 : Standardisation and Regulations

Tuesday 20th October 16h00-17h30

Session chaired by : Christopher Roof (US Departement of Transport / VOLPE, USA)

Research to Support New Entrants to Public Airspace and Aircraft Noise Certification	**David Read / Christopher Roof** (U.S. Department of Transportation / Volpe)	**USA**
EU Drone Regulation	**Nicolas Eertmans** (European commission)	**EUROPE**
ANSI/ASA Standards Activity on Measurement of UAS Noise	**Robert Hellweg** (Hellweg Acoustics)	**USA**
Noise requirements of Unmanned Aircraft due to European Regulation 2019/945	**Michael Wieland** (UAV DACH e.V)	**GERMANY**

Discussion : *Should noise from drones be regulated at the European level?*

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SESSION 5 : The Impact of Urban Air Mobility

Wednesday 21st October 09h00-11h00 (session in parallel with session 9)

Session chaired by : Roalt Aalmoes (Royal Netherlands Aerospace Centre NLR)
Franck Cléro (ONERA, France)

Recommendations for research on the Noise impact of drones in an urban environment	Roalt Aalmoes (Royal Netherlands Aerospace Centre NLR)	NETHER-LANDS
MOSQUITO Project : a fast estimation approach for urban acoustic environment	Franck Cléro (ONERA / DAAA)	FRANCE
From Helicopters to quiet eVTOLs : A manufacturer's perspective	Julien Caillet (Airbus Helicopters)	FRANCE
Noise considerations for designing Skyport Networks	Rohit Goyal (Uber Elevates)	USA
Achieving quiet flying passenger vehicles through numerical simulations, a LBM story	Wouter van der Velden (Dassault Systems)	GERMANY
Assessment of the environmental impact of drone noise in virtual flights	Siyang Zhong (Hong Kong University of Science & Technology)	CHINA

Discussion

SESSION 6 : Tools for Measurement, Analysis, Prediction and Control

Wednesday 21st October 14h00

Session chaired by : David Herrin (University of Kentucky, USA)
François-Xavier Bécot (Matelys, France)

Sound Localisation of Drones using an Acoustic Camera	**Pablo Alloza** (GFAI Tech GmbH)	**GERMANY**
Scanning Laser Vibrometer measurements for assessing the origin of structure borne sound in drones	**Floren Deux** (Polytech France)	**FRANCE**
UAS Sound Level Prediction using Panel Contribution Analysis	**David W. Herrin** (University of Kentucky)	**USA**
Active Noise Cancellation of Drone Propeller Noise through Waveform Approximation and Pitch-Shifting	**Michael Narine** (Georgia State University)	**USA**
Exploring Noise reduction for fixed wings UAV	**Michael J. Kingan** (University of Auckland)	**NEW ZEALAND**

Discussion

SESSION 7 : Acoustic Detection and Identification of Drones

Monday 19th October 16h00-18h00 (session in parallel with session 2)

Session chaired by : Lucille Pinel-Lamotte (MicrodB, France)
Martin Blass (Joanneum Research Forschungsgesellschaft, Austria)

Introduction Anti-Drone Solutions	Lucas Le Bell (Cerbair)	FRANCE
UAV detection from acoustic signature: requirements and state of the art	Lucille Pinel-Lamotte (MicrodB)	FRANCE
A Real-Time System for Joint Acoustic Detection and Localization of UAVs	Martin Blass (Joanneum Research Forschungs-gesellschaft)	AUSTRIA
Flight path tracking and acoustic signature separation of swarm quadcopter drones using microphone array measurements	Gert Herold (Technische Universität Berlin)	GERMANY
UAV's localization from a microphone array by exploiting the harmonic structure of the sound produced	Torea Blanchard (LAUM / Le Mans University)	FRANCE
Two Dimensional Convolutional Neural Network Frameworks Using Acoustic Nodes for UAV Security Applications	Theoktisti Marinopoulou (Centre for Research and Technology Hellas / Information Technologies Institute - CERTH/ITI)	GREECE

Discussion : *Drone localisation and identification*

SESSION 8 : Drone Audition - Listening Drones

Tuesday 20th October 09h00-11h00 (session in parallel with session 3)

Session chaired by : Antoine Deleforge (INRIA, France)
Makoto Kumon (Kumamoto University, Japon)

Drone Audition for Search and Rescue: Datasets and Challenges	**Antoine Deleforge** (INRIA Nancy)	**FRANCE**
Development of surface-processed low-noise propeller for search and rescue tasks with drone audition	**Kotaro Hoshiba** (Kanagawa University)	**JAPAN**
Proposal of Cognitive Drone Audition based on Cognitive Dynamic Systems	**Hiroshi Okuno** (Waseda University)	**JAPAN**
3D Sound Source Tracking for Drones Using Direction Likelihood Integration	**Taiki Yamada** (Tokyo Institute of Technology)	**JAPAN**
Signal-to-Noise Ratio Enhancement Method for Improving Sound Source Detection of Drone-mounted Phased Microphone Array	**Yeong-Ju Go** (Chungnam National University)	**SOUTH COREA**
Advances in Sound and Speech Signal Processing at the Presence of Drones	**Olivier Jokisch** (Leipzig University)	**GERMANY**

Discussion : *Drone Audition*

SESSION 9 : Noise Generation and Mitigation - 1

Wednesday 21st October 09h00-11h00 (session in parallel with session 5)

Session chaired by : Young-Min Shim (Dotterel Technologies, New-Zealand)
Julien Caillet (Airbus Helicopters, France)

Aeroacoustic study of small propellers with Serrated Trailing Edge for a quieter drone	Paolo Candeloro (UniCusano)	ITALY
Interpolation based acoustic transfer function for drone noise simulation	Hanbo Jiang (Hong Kong University of Science & Technology)	CHINA
Experimental Investigation of Contra-Rotating multi-rotor UAV Propeller noise	Ryan S. McKay (Dotterel Technologies)	NEW ZEALAND
Multi-scale morphological effect on noise level and frequency characteristics of drone propellers	Ryusuke Noda (Kyoto University)	JAPAN
Drone Noise and the Influence of Support Structure	Simon Watkins (RMIT)	AUSTRIA
Experimental Investigation of Noise Characteristics of Rotors	Koichi Yonezawa (Central Research Inst. of Electric Power Industry)	JAPAN

Discussion :

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SESSION 10 : Noise Generation and Mitigation - 2

Wednesday 21 October 16h00-18h00

Session chaired by : **Tiziano Pagliaroli** (UniCusano, Italie)
Julio Cordioli (University of Florianopolis, Brazil)

Experiments on UAV rotor noise at low Reynolds and low Mach numbers	**Hélène Parisot-Dupuis** (ISAE-SUPAERO / Toulouse)	**FRANCE**
The Sound of the Drone Uprising' An Exploration into the Aero-acoustic Performance of Drone Blades	**Josephine Nixon** (London South Bank University)	**GREAT BRITAIN**
Experimental Investigation on Acoustics and Efficiency of Ducted Electric Rotors	**Ronja Koenig** (Robert Bosch GmbH)	**GERMANY**
On the design of acoustic liners for drone ducted fans	**Julio Cordioli** (University of Florianopolis)	**BRAZIL**
Chaotic and wavelet aeroacoustic analysis of twin rotors for drone propulsion	**Tiziano Pagliaroli** (UniCusano)	**ITALY**
CFD-CAA approach for sound generation and propagation in the UAV propeller with subsonic flow	**Sergei Timushev** (Moscow Aviation Institute)	**RUSSIA**

Discussion