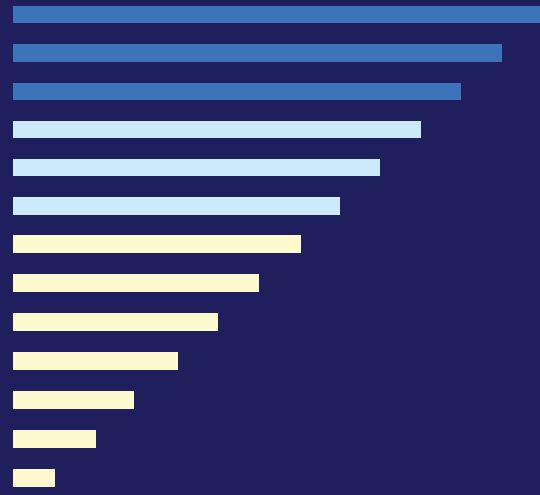


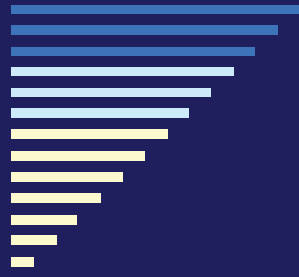


NAU experience in FP participation

Oleksandr Zaporozhets
National Aviation University

AERO-UKRAINE Workshop 21.04.2011
National Aerospace University "KhAI"





Scientific school “Aviation acoustics”

Professor Vadim Tokarev

- 2 DrSc, 13 CdSc
- 8 monographs
- Acoustic Laboratory of the NAU

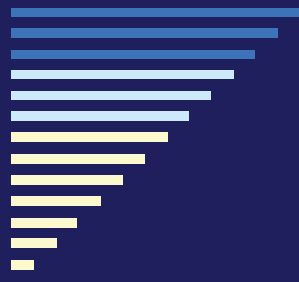


Токарев Вадим Иванович

Large reverberation chamber

volume 173.7 cub. meters, $f_{\text{limit}} = 125 \text{ Hz}$





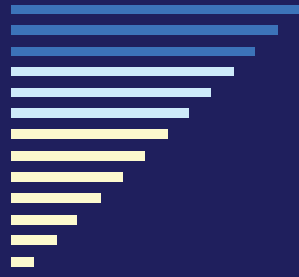
Small reverberation chambers

total volume = 4 m³

Sound transmission performances
for *Antonov-140*, *Antonov-148*



Window between
the chambers



RESEARCH

- Fundamental and Applied Aviation Acoustics
- USSR period - co-operation with:**
- Central Aero- Hydrodynamical Institute (TsAGI, Moscow),
 - State Scientific Research Institute of Civil Aviation (GosNIIGA, Moscow), and
 - Aviation Design Offices of Tupolev, Il'ushin, Antonov, Yakovlev.



Scientific Research Centre of Environmental Problems of Airports

in National Aviation University

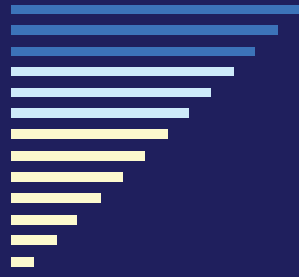
license from Ukrainian CAA, 2006

- Research investigations for airports of the Ukraine: №311-X06 від 01.04.2006р., №351-X06 від 1 04. 2006р., № 317-X06 від 10 07 2006р., № 356-X06 від 1.10. 2006 р., № 365-X06 від 1.11.2006 р., № 375-X06 від 15.11.2006 р., № 422-X07 від 20. 12. 2006р., № 410-X07 від 02.02.2007 р., № 414-X07 від 15.02.2007 р., № 422-X07 від 10/12.2006 р., № 430-X07 від 16.02.2007 р., № 433-X07 від 15.05.2007 р., № 434-X07 від 1.06.2007 р., № 470-X07 від 21.09.2007 р., № 518-X08 від 4.03.2008 р., № 511-X08 від 1.02.2008 р., № 524-X08 від 19.05.2008 р., № 521-X08 від 24.03.2008 р., № 524-X08 від 2.06.2008 р., № 532-X08 від 4.05.2008 р., № 536-X08 від 14.05.2008 р., № 544-X08 від 9.06.2008 р., № 559-X08 від 8.08.2008 р., № 584-X09 від 1.01.2009 р.

□ Accreditation in UkrSEPRO (УкрСЕПРО)

□ <http://acoulab.nau.edu.ua/index.html>



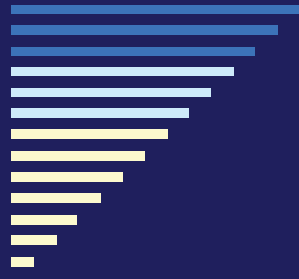


NATO project, 1999-2000

Prediction of noise from aircraft

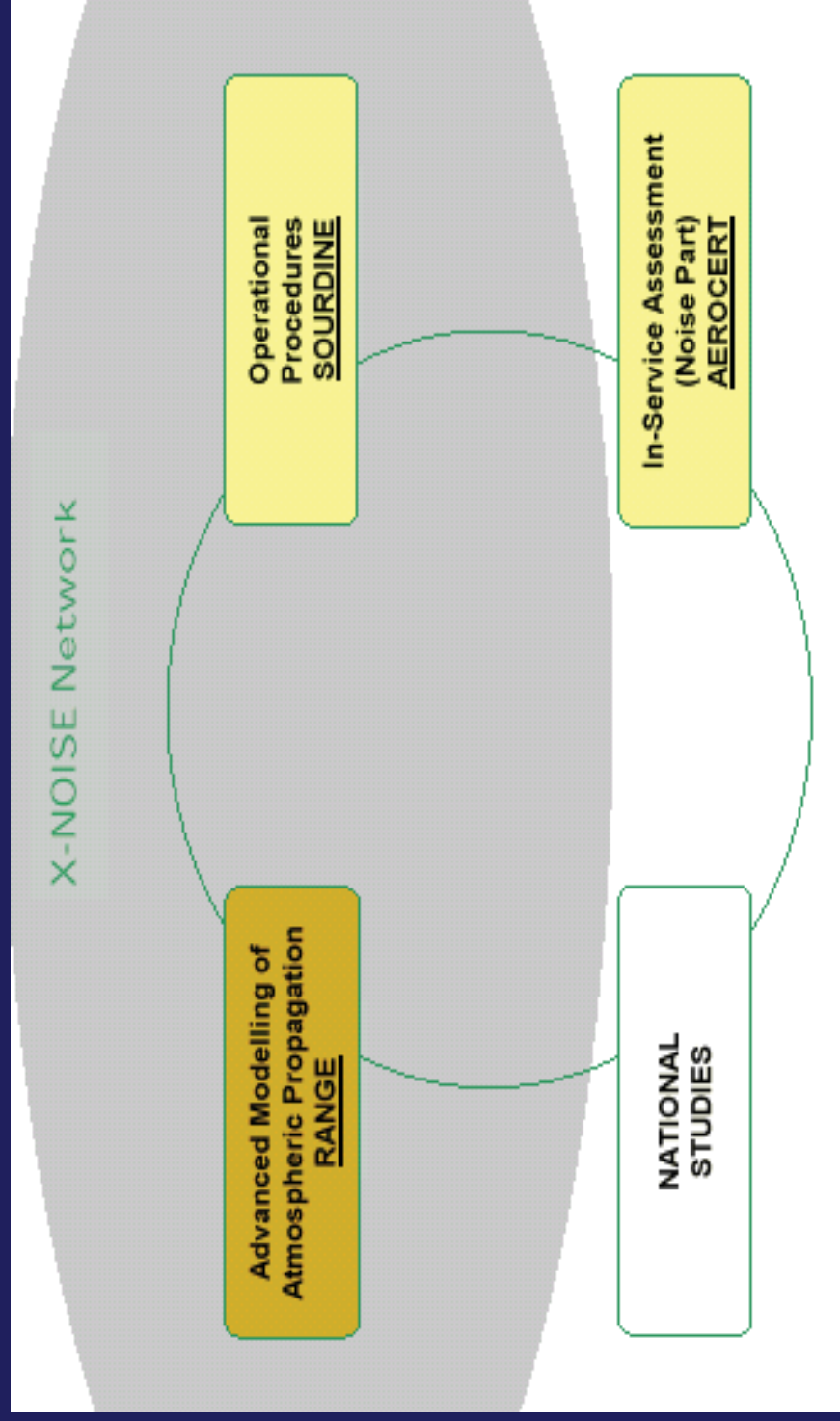
EST.CLG.974767

between NAU & University of Hull (UK)



RANGE-proposal

EU FP-6, 1999



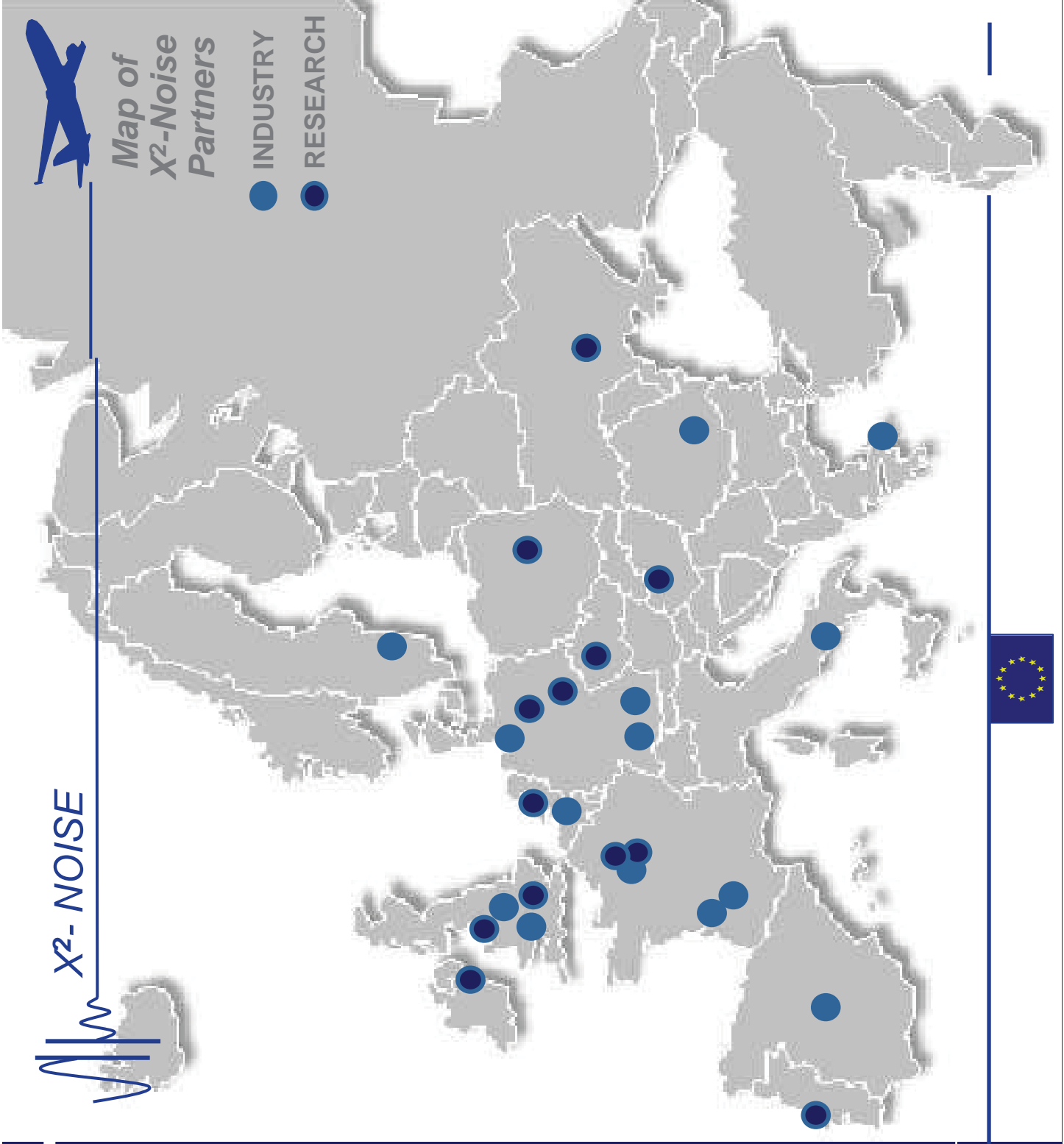


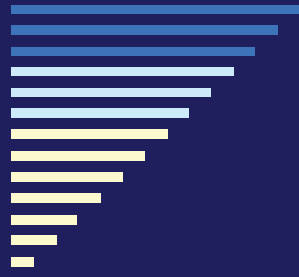
X²- NOISE



Map of X²-Noise Partners

- INDUSTRY
- RESEARCH





Silence ®, 2002-2004

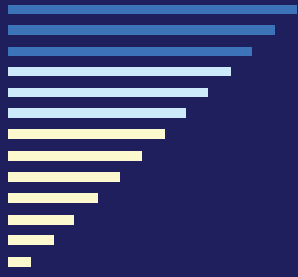
SNECMA - NAU:

**Tools for generic aircraft noise
prediction model**

Student sub-project:

SNECMA - NAU - Ecole Centrale de Lyon

**Student graduation paper for Bachelor
degree**



Silence® - Tools for generic aircraft noise prediction model

For noise propagation effects:

Dependence from topographical condition:

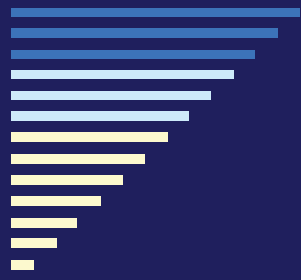
- reflection & interference
- diffraction
- transmission

Dependence from atmosphere condition

- absorption
- refraction

For noise installation effects:

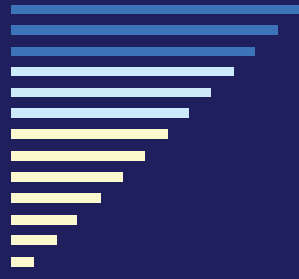
- shielding by wing, fuselage



Student graduation paper for Bachelor degree

Studies of flight trajectories for aircraft take-off/climbing and descending modes before landing

Computations and build up of the flight paths for take-off/climbing and landing in conditions of normal flight with accordance to the requirements of Flight Operation Guide



EPNL for aircraft at approach

Airplane	predicted	measured
Tupolev-154	105.8	106.0±0.9
Tupolev-154M	100.7	102.1±0.5
Tupolev-204	102.2	99.9±2.7
Yakovlev-40	98.7	97.2±3.8
Yakovlev-42	103.7	102.4±1.6
Il'ushin-62M	100	103.5±3.8
Il'ushin-86	105.7	105.1±0.3

Environment Protection Symposium



“Aircraft Noise & Emission Trade-Offs”

Supported by X3-NOISE

2003, 2005, 2008 & 2010

EUROPEAN COMMISSION

RESEARCH DIRECTORATE-GENERAL

New projects FP7

A2:
List of Beneficiaries

SP1-Cooperation

Collaborative project

Small or medium-scale focused research project

FP7-AAT-2010-RTD-1

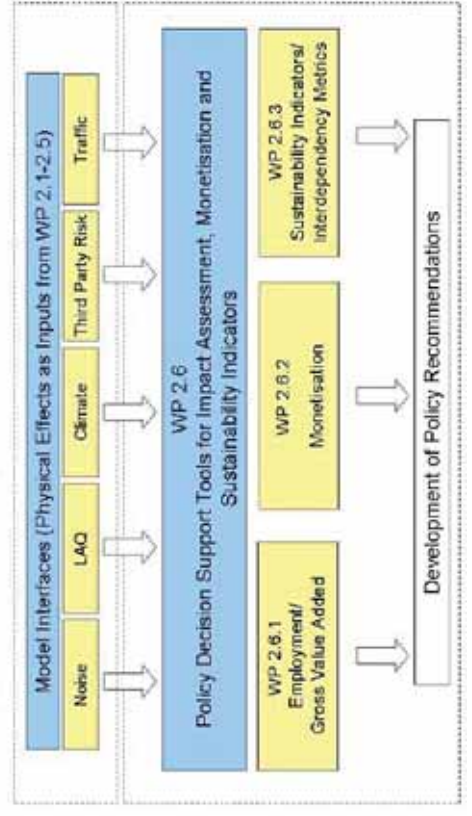
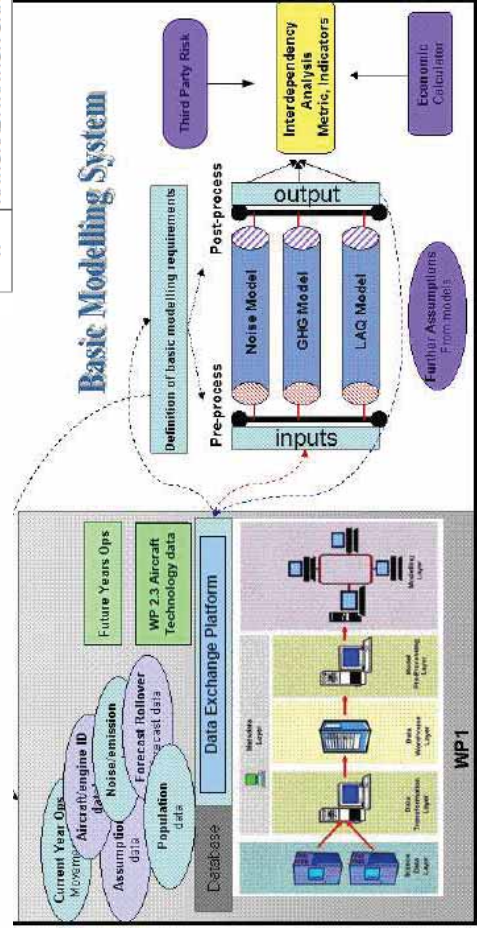
Grant Agreement Number 266465

TEAM_Play

Tool Suite for Environmental and Economic Aviation Metrics
Policy Analysis

ACP0-GA-2010-266465

Project Number ¹	266465	Project Acronym ²	TEAM_Play
List of Beneficiaries			
No	Name	Short name	Country
1	DEUTSCHES ZENTRUM FUER LUFT - UND RAUMFAHRT EV	DLR	Germany
2	STICHTING NATIONAAL LUCHT- EN RUIMTEVAARTLABORATORIUM	NLR	Netherlands
3	ENVISA SAS	ENVISA	France
4	TOTALFORSVARETS FORSKNINGINSTITUT	FOI	Sweden
5	THE MANCHESTER METROPOLITAN UNIVERSITY	MMU	United Kingdom
6	QINETIQ LIMITED	QinetiQ	United Kingdom
7	ANOTEC CONSULTING SL	Anotec	Spain
8	Ingenieurbüro Janicke	JanC	Germany
9	CAMBRIDGE ENVIRONMENTAL RESEARCH CONSULTANTS LTD	CERC	United Kingdom
10	INSTITUTUL NATIONAL DE CERCETARE-DEZVOLTARE TURBOMOTOARE - COMOTI	COMOTI	Romania
11	SNECMA SA	Snecma	France
12	AIRBUS OPERATIONS SAS	Airbus	France
13	ROLLS ROYCE PLC	RR	United Kingdom
14	THE CHANCELLOR, MASTERS AND SCHOLARS OF THE UNIVERSITY OF CAMBRIDGE	UCAM	United Kingdom
15	Ecole Nationale de l'Aviation Civile (ENAC)	ENAC	France
16	TAKS B.V.	TAKS	Netherlands
17	NATIONAL AVIATION UNIVERSITY	NAU	Ukraine



New projects FP7

EUROPEAN COMMISSION

RESEARCH DIRECTORATE-GENI

SP1-Cooperation

Coordination and support action

Coordination (or networking) action

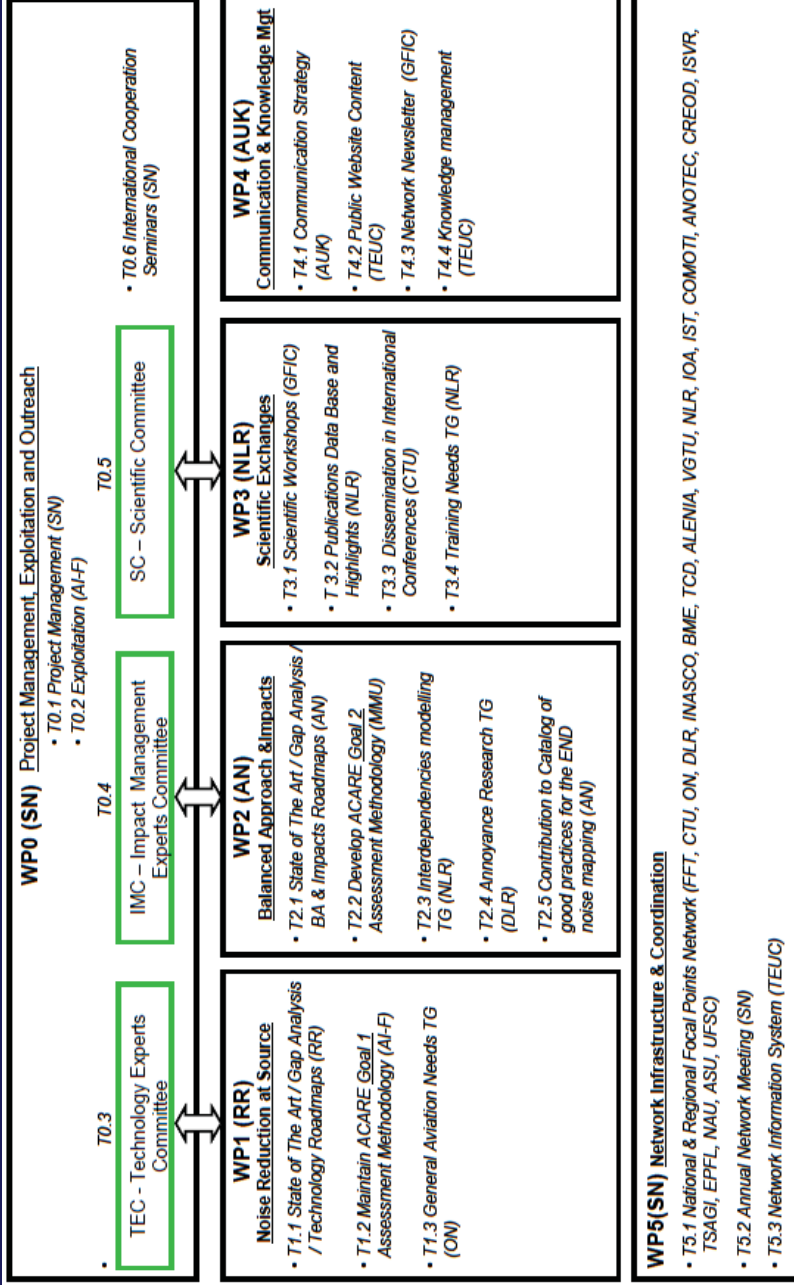
FP7-AAT-2010-RTD-1

Grant Agreement Number 265943

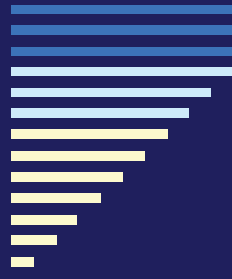
X-NOISE EV

Aviation Noise Research Network and Coordination

ACP0-GA-2010-265943



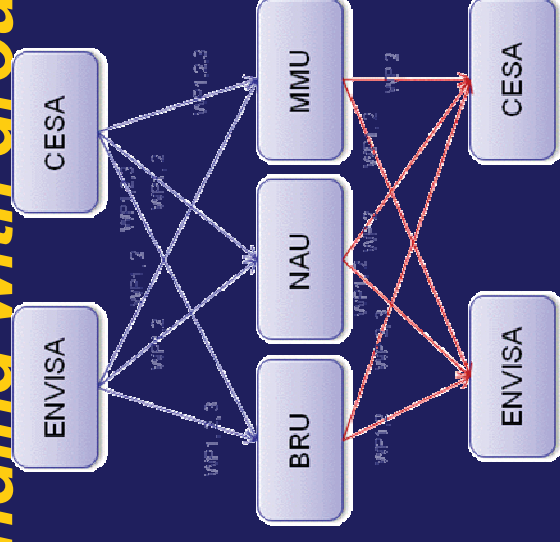
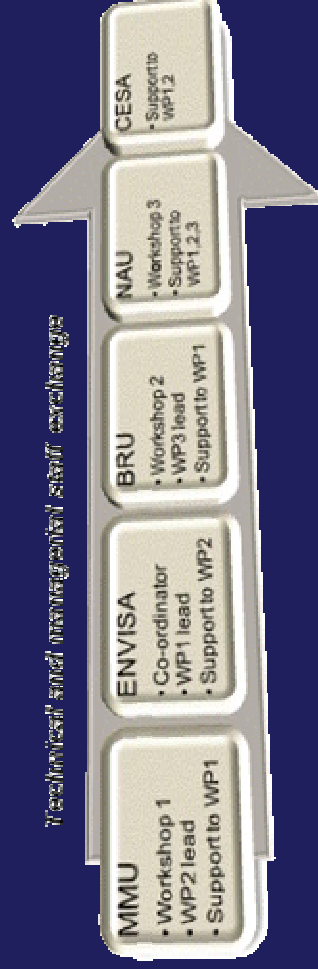
Task	Cooperation	Country
16	Free Field Technologies (FFT)	BE
17	Institute of Aviation (IoA)	PL
18	National Research & Development Institute for Gas Turbines (COMOTI)	RO
19	Ecole Polytechnique Fédérale de Lausanne (EPFL)	CH
20	Integrated Aerospace Sciences Corporation (INASCO)	HE
21	Budapest University of Technology and Economics (BME)	HU
22	Czech Technical University (CTU)	CZ
23	Vilnius Gediminas Technical University (VGTU)	LT
24	Trinity College Dublin (TCD)	IE
25	Instituto Superior Tecnico (IST)	PT
26	National Aviation University (NAU)	UKR
27	Ain Shams University (ASU)	EG
28	Federal University of Santa Catarina (UFSC)	BR
29	Teuchos (TEUC)	FR



New proposals for FP-7

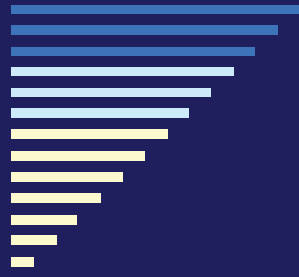
SMART AIR BASED POWER (SAB - P):

AAT.2011.6.3-2. Take-off and landing with around-based power



FP-7.PEOPLE.MARIE CURIE ACTIONS.

Development of Aviation and Environment Training Centre and Interdependency Tools to Enhance Environmental Decision-making (ETC-ITD)



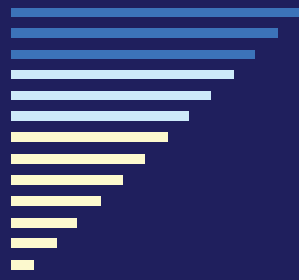
New proposals for TEMPUS, 2011-2012

- *Innovative Masters Program in Environmental Noise and Air Pollution*
- *partners: TUD (Germany), INRETS (France), TU Gediminas (Lithuania), Lyon University (France),...*
- *Specialty “Applied ecology” (transport branch)*



Scientific training

- **INRETS**, Bron, France “Optimization strategies to reduce aircraft noise and pollution” in frame of project SRESR 2007-2010 BAC/BIR CLUSTERS 2008 Cluster 8 de la Région Rhône-Alpes (01.01.2009-30.10.2009, **Konovalova O.**)
- **Institute of Meteorology and Climatology**, Garmish-Parkenkirchen, Germany (2008p., **Synylo K.**)
- **Gesellschaft für Luftverkehrsforschung mbH**, Berlin, Germany (2008, **Gosudarska I.**).
- **Dresden Technical University**, Dresden, Germany (2008-2010, **Gosudarska I., Synylo K., Shevchenko U., Makarenko V., Nikitchenko U.**)
- **Slovak Military Academy**, Liptovsky-Mikulash, Slovak Republic (2007-2009, **Zaplatsynskiy V., Khalmuradov B.**)
- **the University of the Bundeswehr**, Munich, Germany, 2010, **Shevchenko U.**



GREEN TALANT 2010



Minister of
Education of
Germany Annette
Schavan &
U.Nikitchenko



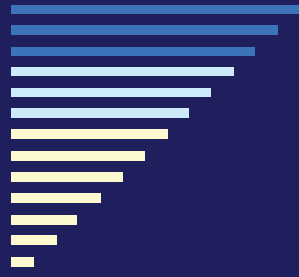


CAEP ICAO

□ Cooperation with aviation establishments of Ukraine

□ Activities in international groups for new civil aviation regulations





Publications

K. Attenborough,
V. Tokarev,
O. Zaporozhets

**AIRCRAFT NOISE:
assessment,
prediction and
control**

Glyph International,
Taylor and Francis,
2011

Editorial Board:

Applied Acoustics

Acta Acustica

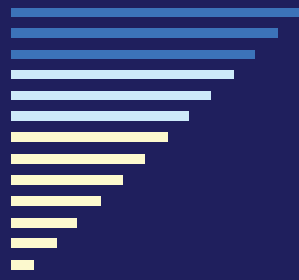


ЕКОЛОГІЧНИЙ ЖУРНАЛ

Kuba Yspaiia

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1-2'2010



Thank you for your attention!

