

Partners of the GRAIN2 Project

Europe

CIMNE
Airborne Tech
Airbus Group Innovation
Airbus Operations
CFD-Software
CIRA
Cranfield Univ.
DLR
Eurocontrol
KTH Stockholm
Honeywell
INRIA
LEITAT
Glasgow Univ.
NLR
NUMECA Intl.
RWTH Aachen Univ.
Sheffield Univ.
TU Kaiserslautern
UPC Barcelona
UPM
VKI

China

CAE
ACAE
ACTRI
ARI
ASRI
BIAM
BUAA
CARERI
CAUC
COMAC
CQU
FAI
GTE
HUST
IACAS
JIUZHOU
NIMTE
NPU
NUAA
PKU
THU
XJTU
ZJU



GRAIN 2

*GReener Aeronautics
International Networking*

2nd GRAIN2 Open Workshop 2015
'Greening Aviation – A Global Challenge'

Xi'an, China, 5th – 8th May 2015



Coordination & Management

China:

DENG Ying, CAE
GRAIN2 Coordinator
SHI Jinmin, MIIT
Scientific Officer

Europe:

Gabriel Bugada and Jacques Periaux, CIMNE/ UPC
GRAIN2 Coordinators
Dietrich Knoerzer, EC, DG Research & Innovation, Aeronautics
Scientific Officer

Organized by

- Chinese Aeronautical Establishment (CAE)
- International Centre for Numerical Methods in Engineering (CIMNE)
- Aeronautical Computation Technology Research Institute (ACTRI)

Sponsored by:

**The Ministry of Industry and Information Technology of China (MIIT)
and the European Commission (EC), DG Research & Innovation**



For registration and information
please visit:
www.cimne.com/grain2//workshop
www.cae.ac.cn

Advisory Committee

LI Benjian, MIIT, China
ZHENG Kai, MIIT, China
SHI Jinmin, MIIT, China
WEI Jinzhong, CAE, China
Manuela Soares, DG RTD – Transport, EC, Brussels, Belgium
Dietrich Knoerzer, DG RTD – Aeronautics, EC, Brussels, Belgium
Laurent Bochereau, EC-Delegation, Beijing, China
Daniel Redondo, Airbus Operations, Spain

Scientific/ Technical Committee

HUA Jun, CAE, China	Adel Abbas, UPM, Spain
LUO Shilu, CAE, China	Anders Brødsjø, Airborne, Netherlands
SUN Xiasheng, ASRI, China	Charles Hirsch, NUMECA International, Belgium
NIU Wensheng, ACTRI, China	Domenico Quagliarella, CIRA, Italy
WANG Guoqing, CARERI, China	Frank Thiele, CFD-Software, Germany
LI Jibao, ACAE, China	Gabriel Bugeda, CIMNE, Spain
CHEN Yingchun, COMAC, China	Herman Deconinck, VKI, Belgium
YI Xiaosu, BIAM, China	Jacques Periaux, CIMNE, Spain
ZHANG Jun, BUAA, China	Joeri de Ruytter, Honeywell, Belgium
HUANG Wenchao, ASRI, China	Konstantinos Kontis, Univ. of Glasgow, UK
DING Shuiting, BUAA, China	Luc de Nijs, NLR, Netherlands
SUN Xiaofeng, BUAA, China	Magí Galindo, LEITAT, Spain
GAO Zhenghong, NPU, China	Maksim Danilov, DLR, Germany
FU Song, THU, China	Nicolas Gauger, TU Kaiserslautern, Germany
BAI Jie, CAUC, China	Ning Qin, Univ. of Sheffield, UK
ZHAO Ning, NUAA, China	Ovidiu Dumitrache, Eurocontrol, Belgium
ZHENG Yao, ZJU, China	Pierre Vialettes, Airbus Group Innovation, France
MING Xiao, NUAA, China	Shijun Guo, Cranfield Univ., UK
LIU Qing, CQU, China	Shia-Hui Peng, KTH Stockholm, Sweden
	Toan Nguyen, INRIA, France
	Xavier Prats-Menendez, UPC Barcelona, Spain
	Wolfgang Schröder, RWTH Aachen Univ., Germany

Workshop Organizing Committee

DENG Ying, CAE, China
NIU Wensheng, ACTRI, China
Gabriel Bugeda, CIMNE, Spain
Jacques Periaux, CIMNE, Spain
Jordi Pons-Prats, CIMNE, Spain

Technical Secretariat:

HAO Jia	CAE, China	e-mail: haojia@cae.ac.cn
ZHANG Rui	CAE, China	e-mail: zrbuaa@sina.com
LI Li	ACTRI, China	e-mail: westlili@163.com
Jordi Pons-Prats	CIMNE, Spain	e-mail: jpons@cimne.upc.edu

Motivation

The network building support action GRAIN2, co-funded by the EU and China aims to provide inputs and contributions to technology roadmaps for greening future aviation for meeting requirements such as reduction of aviation emissions, fuel consumption and perceived noise.

For achieving progress towards the identified targets, efforts in green technologies will be directed to three major lines: - Air vehicle, - Air Traffic Management System and - Sustainable Energies.

In this Open Workshop on greening technologies will be addressed in the following three areas:

- i) **Greening technologies for aircraft and aero-engines:** innovative methods and tools for optimized aircraft and aero-engines with highest fuel efficiency, optimized propulsion/ airframe system leading to minimize emissions, prediction of aircraft emissions effects based on new engines technologies and alternative fuels, multidisciplinary/ multi-physics modelling, simulation, optimization and control, new multifunction materials, including environmentally sustainable materials and smart structures;
- ii) **Greening the operational environment:** utilization of environmentally friendly chemicals in production, operation and maintenance, optimized handling and control of the engine exhaust emissions, such as to low or zero emission aircraft taxiing, new low-emission ATM concepts;
- iii) **Reducing the carbon footprint of aviation via sustainable alternative fuels:** development of biofuels for greenhouse gas emission reduction; increase the knowledge of acceptance conditions at engine aircraft level, optimization of the aircraft/ alternative fuel combination.

GRAIN2 aims to identify innovative RTD methods including design tools and a simulation environment based on high-performance computer (HPC) for the different Key Green Technology (KGTs) areas according to the future needs of the aeronautics industry, in particular:

- to deeper understand the mechanism of engine exhaust emissions, to improve fuel efficiency and environmental aircraft performance, to lower aero-engine and airframe noise;
- to introduce new materials with multiple functions, to address the development of aeronautics biofuels for greenhouse gas emission reduction.

Objectives

This 2nd Open Workshop of GRAIN2 will focus on the state of the art in technologies areas addressed by the Key Green Technologies (KGT) groups of GRAIN2. The presentations will address technologies for greener aviation including most promising developments of the relevant technologies:

- **KGT1: Propulsion related technologies,**
- **KGT2: Flight physics and aero-acoustics,**
- **KGT3: Environmentally friendly materials and advanced structures,**
- **KGT4: Advanced CNS/ATM systems for sustainable air transport.**

Lecture sessions/ Panel discussions

The Open Workshop is a two days event with plenary; and parallel lectures delivered by GRAIN2 partners, as well as series of discussions following the KGT sessions.

- Plenary sessions of invited keynote speakers, senior lecturers linked to the KGTs
- State-of-the-art reviews delivered by the KGT chairpersons;
- Technical parallel sessions of Key Green Technology (KGT) groups

It is followed by the Mid-term Review Meeting of the GRAIN2 consortium.

EU-China Day on Research & Innovation Policy in Aviation

Senior representatives from the *Ministry of Industry and Information Technology (MIIT) of China* and the *European Commission (EC)* and from industry and research will address future needs and perspectives for Aviation. Possibilities for future EU-China research cooperation will be tackled.

Expected outcome of the GRAIN2 Workshop

The outcome of the GRAIN2 workshop should contribute to a green leverage in the context of the Europe's Vision for Aviation 'Flightpath 2050' and to preparing future research cooperation of Europe and China within the EU Framework Programme for Research & Innovation 'Horizon 2020'.

Who should attend?

The workshop will be of interest to engineers and researchers involved in areas of greening technologies for aviation as well as for experts, decision-makers and officials interested in aeronautics co-operation between China and Europe.