FLEXIBLE ENGINEERING TOWARD GREEN AIRCRAFT

CAE tools for sustainable mobility

Università di Roma Tor Vergata

FSI Tools at Tor Vergata

Prof. Marco Evangelos Biancolini

(rbf-morph) ANSYS DESIGN METHODS RIBES RBF4AERO SEVENTH FRAMEWORK PROGRAMME Clean Sky

Introduction

(rbf-morph)

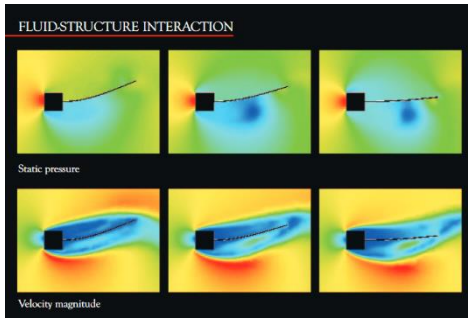
ANSYS®

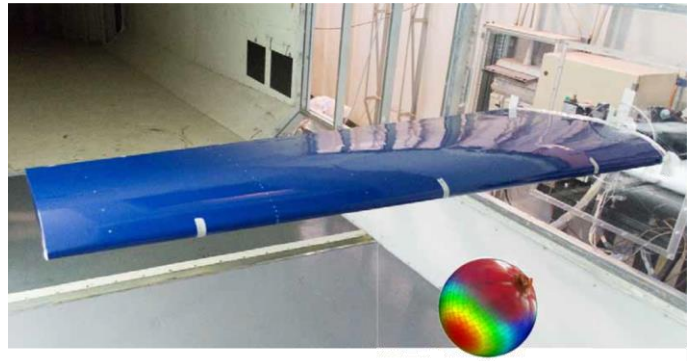
12 CYLINDERS
TRANSIENT FSI

https://youtu.be/A0WPDyhlr8Q

Research path

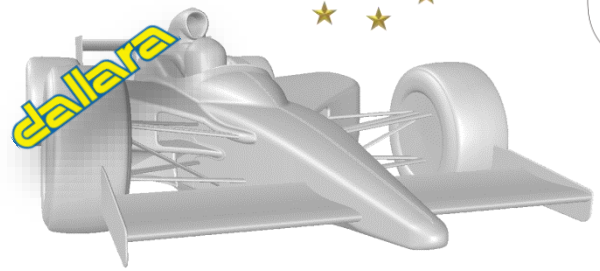
- The first UDF in 2005 (2D and 3D) for **time marching solutions**.
- RBF for **mesh morphing** and pressure mapping was introduced in 2009 with RBF Morph Fluent Add On.
- RBF Morph Stand alone for FSI with **OpenFoam** released in 2012.
- RBF4AERO (www.rbf4aero.eu) implementation (**cross solvers**, steady, 2-way and modal) 2013-2016
- RIBES (www.ribes-project.eu) implementation
- RBF Morph Fluent Add On **advanced FSI module** (steady and transient, HPC)
- 3 Awards! (2005, 2011, 2013)





RIBES

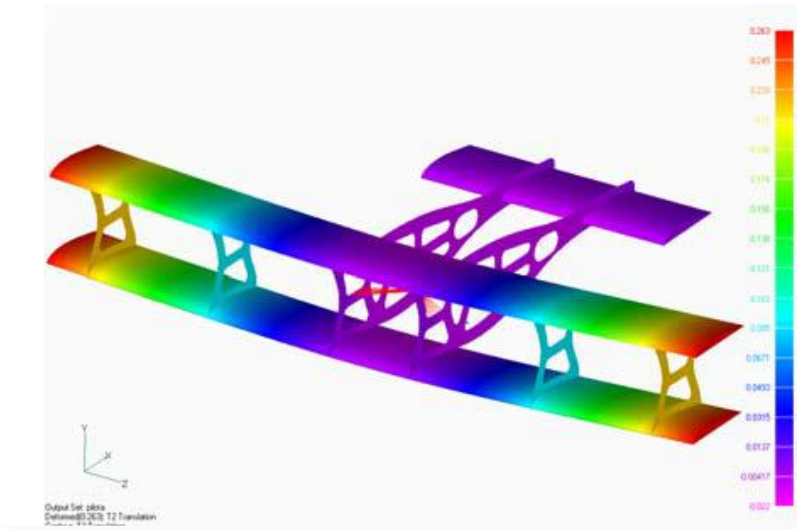
RBF4AERO

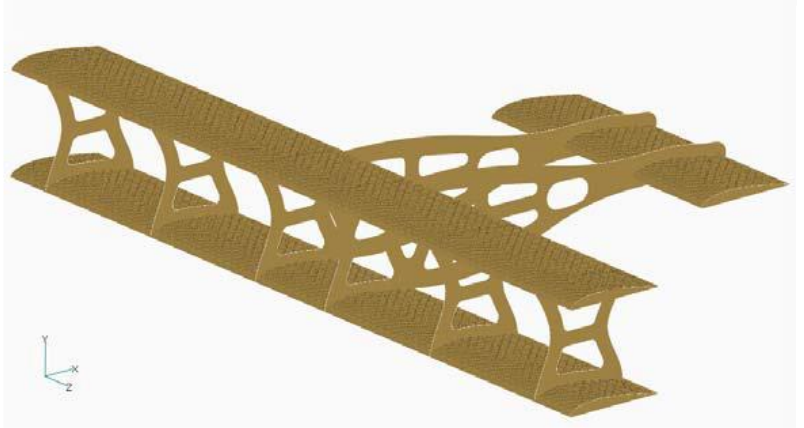


ANSYS

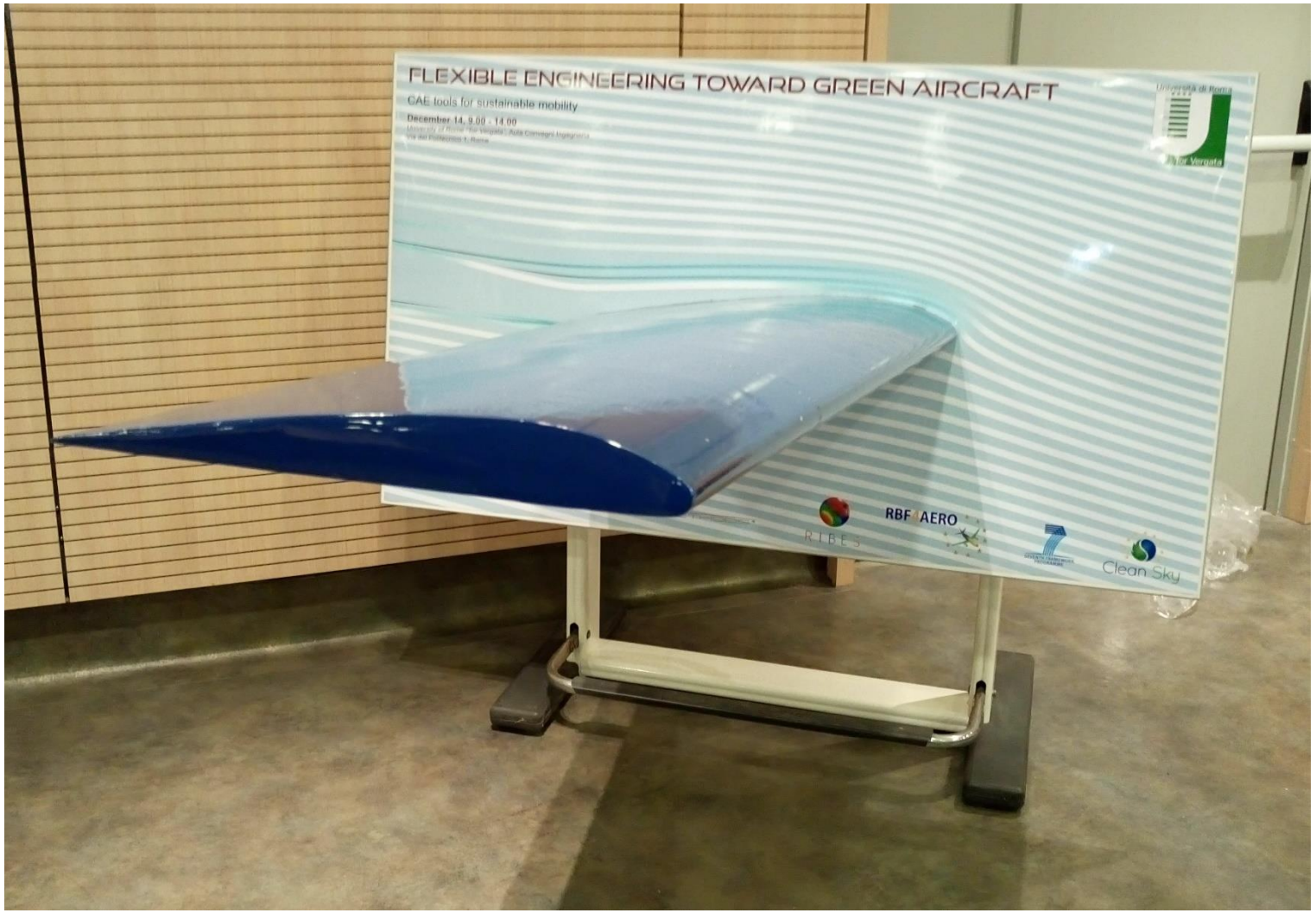
(rbf-morph)™

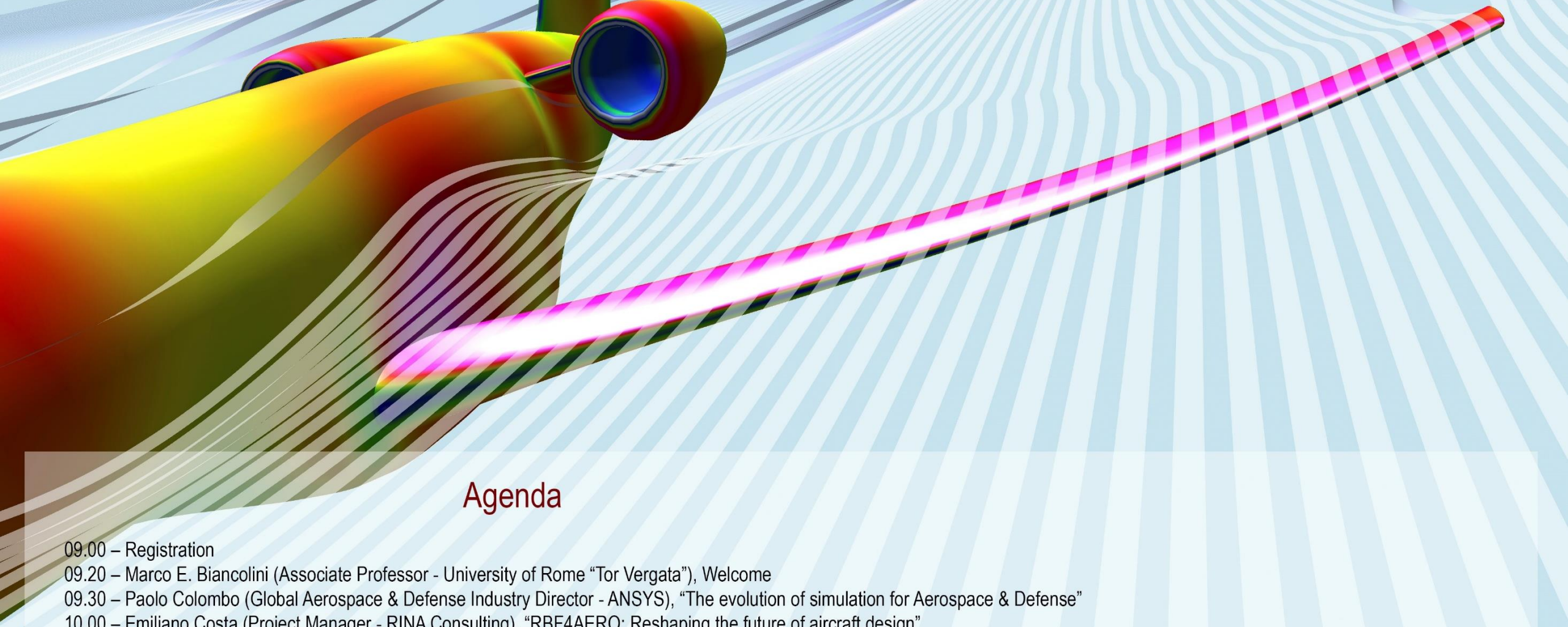
2007 event we exhibited a corrugated board aircraft…





…2017 event we have the RIBES wing!





Agenda

09.00 – Registration
09.20 – Marco E. Biancolini (Associate Professor - University of Rome “Tor Vergata”), Welcome
09.30 – Paolo Colombo (Global Aerospace & Defense Industry Director - ANSYS), “The evolution of simulation for Aerospace & Defense”
10.00 – Emiliano Costa (Project Manager - RINA Consulting), “RBF4AERO: Reshaping the future of aircraft design”
10.30 – Fabrizio Nicolosi (Associate Professor - University of Naples “Federico II”), “Aeroelastic experimental measurements on the RIBES wing”
11.00 – Ubaldo Cella (Senior Researcher - Design Methods), “High Fidelity FSI analysis methods and their validation within the EU RIBES project”
11.30 – Coffee break
12.00 – Franco Mastroddi (Associate Professor - University of Rome “La Sapienza”), “Some issues and challenges on aeroelastic modelling and multi-disciplinary design of aero-space vehicles”
12.30 – Domenico Quagliarella (Head of the Multidisciplinary Analysis and Design Group - CIRA), “Robust Aerodynamic Design of a Supersonic Wing-Body for Natural Laminar Flow ”
13.00 – Massimiliano Genta (Design Loads Engineer - Piaggio Aerospace), “Interaction between gusts and loads of highly flexible wings: the AeroGust EU project”
13.30 – Open session