



## ***Research in Romania related to Clean Sky***

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- Romanian background in aeronautics
- Preparing Romanian CS participation
- Participation to Clean Sky
- Romanian Aeronautical Industry Beyond 2020

### **Romanian aeronautical industry – main characteristics**

#### *...Before*

- complementary capabilities distributed at national level
- integrated development system – product orientated
- major national interest in both civil and military programs
- centralized allocation of resources

#### *Now ...*

- decentralization of all industrial capabilities – privatization
- no major national development program in industry (incl. aeronautics)
- major national interest in acquisition programs (incl. aeronautics)
- major national policies orientated towards EU integration (national R&D Program)

## Romanian background in aeronautics (cont.)





## Romanian background in aeronautics (cont.)

### Product development - civil

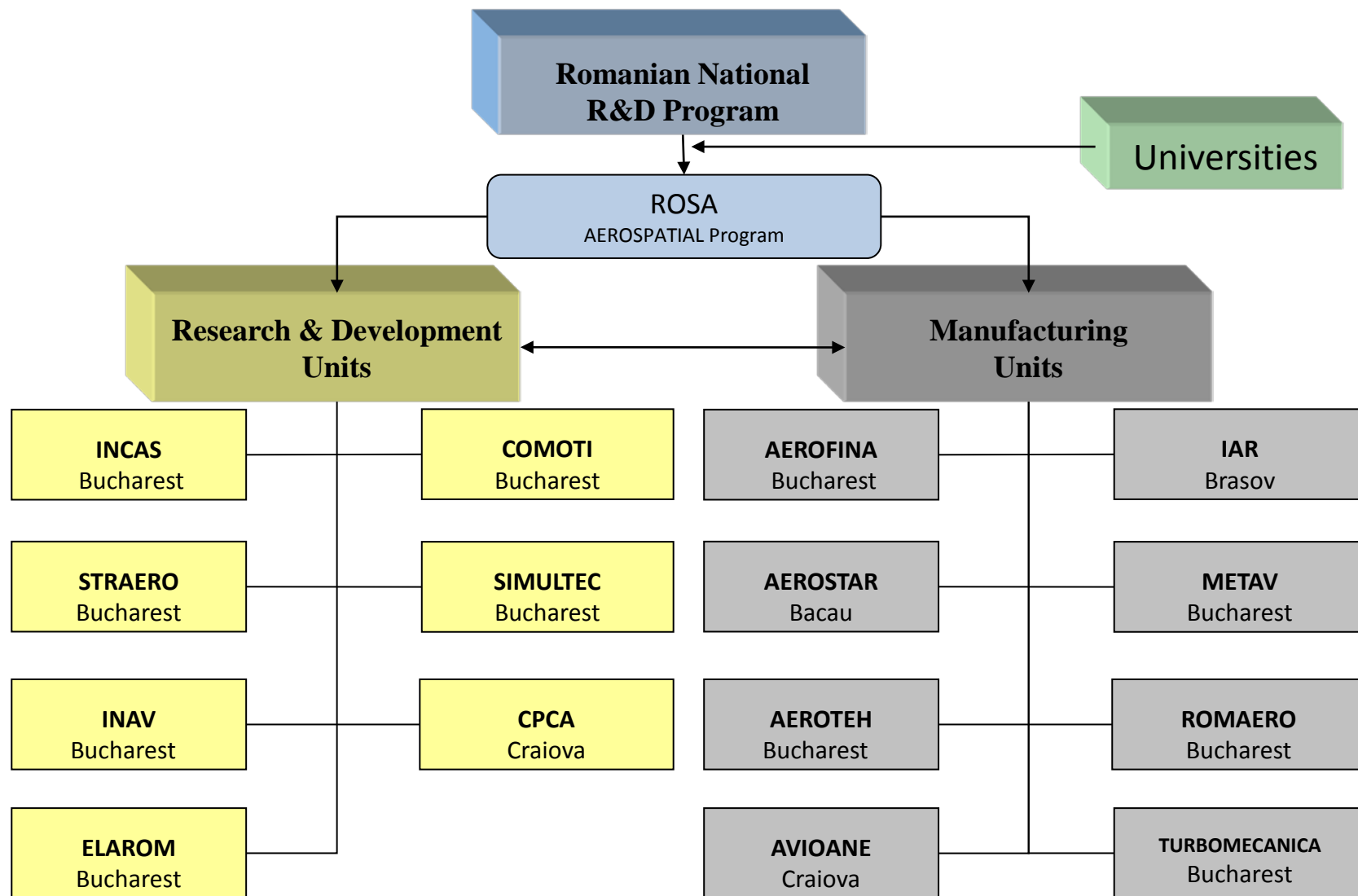


## Romanian background in aeronautics (cont.)

### Product development - military



## Preparing Romanian CS participation ...



## Preparing Romanian CS participation ...

### National R&D establishments

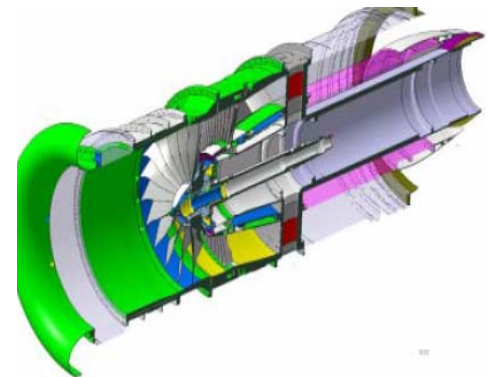
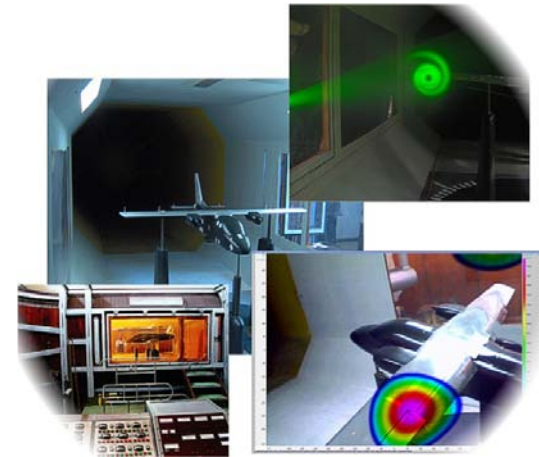
- **INCAS** – National Institute for Aerospace Research “Elie Carafoli”
- **COMOTI** – National R&D Institute for Gas Turbines

### New R&D units – *private R&D sector is growing very fast*

- *GECI International*
- *Stork Aerospace/Fokker Romania*
- *other...*

### Academic R&D units

- University Politehnica Bucharest – Aerospace Dept.
- Military Technical Academy
- Univ. Brasov/Craiova/...





## Industrial capabilities - aerostructures



### Large subassemblies

- BAE Systems
- Boeing,
- Gulfstream



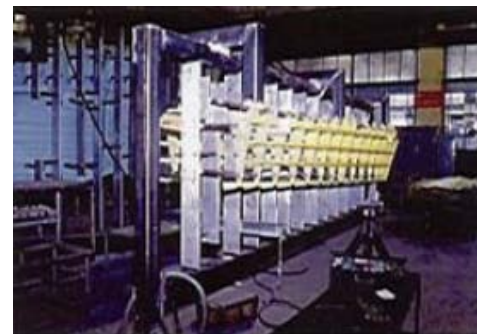
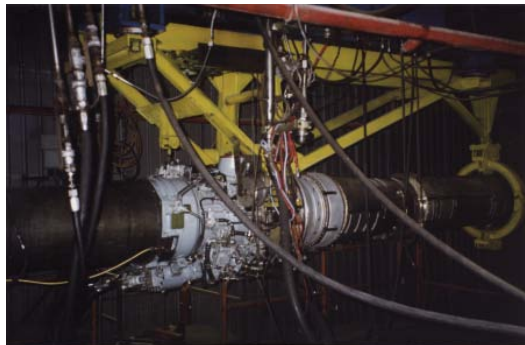
### Large components

- Airbus
- Boeing
- Bombardier



### Industrial capabilities – systems & other

- Engines (license)
- Landing gears
- Actuators and hydraulics
- Wire harnesses and looms
- Turn and mill parts
- Jigs and tooling

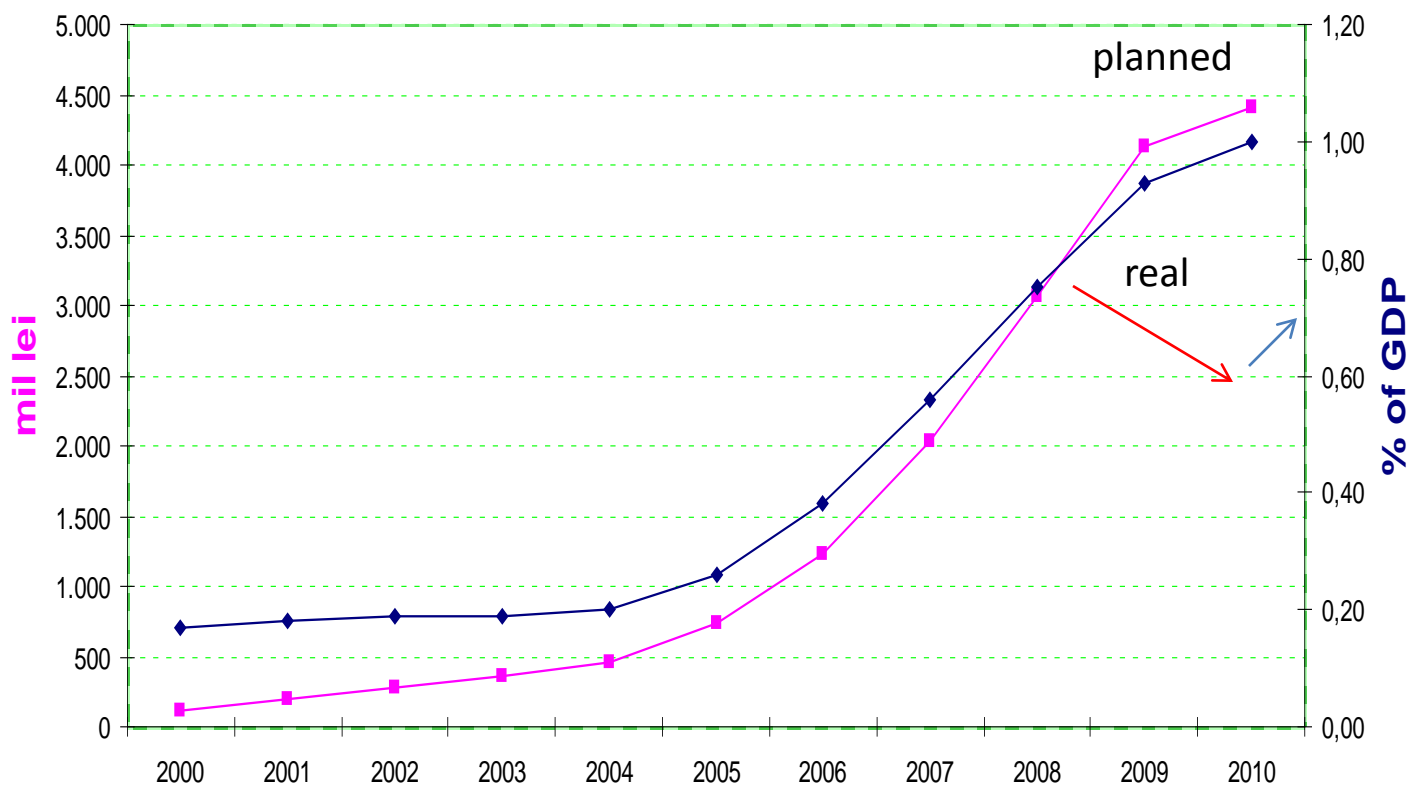


### AEROSPATIAL Program

- Started with pilot phase in 1993
  - Continuity of projects, Stability of management and staff for one decade
  - Since 2001, multi-year budget basis (Gvn. Decision No. 556/2001) as a National R&D Program
- Work Program for 2001-2006, 2007-2013
  - Projects 12-36 months
  - Major areas of space and aeronautics included
  - Basic and applied research
  - Technology development
  - Infrastructure (Centers of excellence)
  - International cooperation
  - Open only for national organizations, but gives incentives for international cooperation
  - Stimulates consortia institutes-universities-industry
  - 5 calls for bottom-up projects, 2 for top-down

## Romanian National R&D Program

### *Public expenditures during 2000-2010*





## Participation to Clean Sky

Participation to Clean Sky was enabled by:

- Participation to the preliminary preparatory actions for Clean Sky (with the Commission – first opinions with technical groups)
- Participation to the preliminary preparatory actions for Clean Sky (in PC – Transport using NCP and experts)
- Cluster participation approach – national/international
- Participation to the process of selection of associates (for SFWA and GRA)

### Major areas of interest for participation

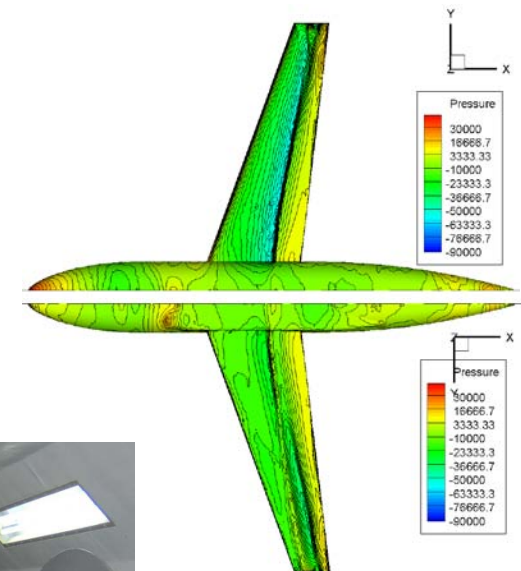
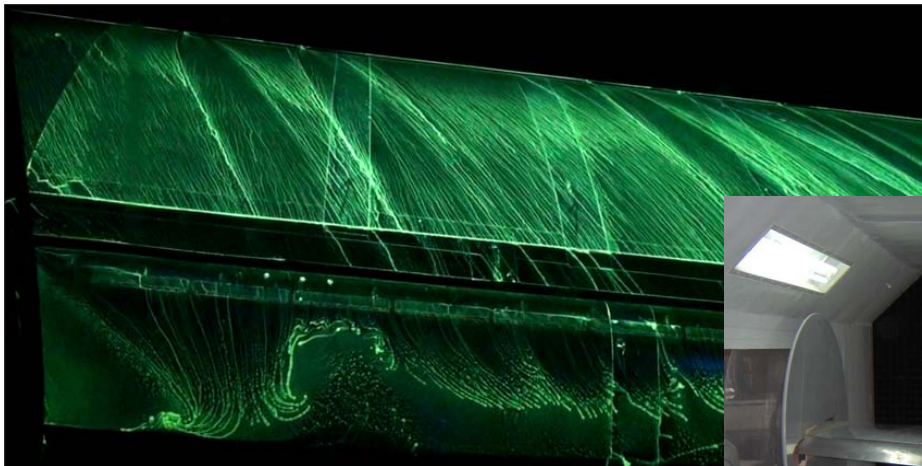
- Low TRL areas – (flow physics, systems, materials&structures)
- Smart airframe structures
- New actuation systems
- Cost-effective manufacturing processes
- Integration of testing infrastructure (mainly wind tunnels)

## CS Participation

### SFWA participation – INCAS Cluster

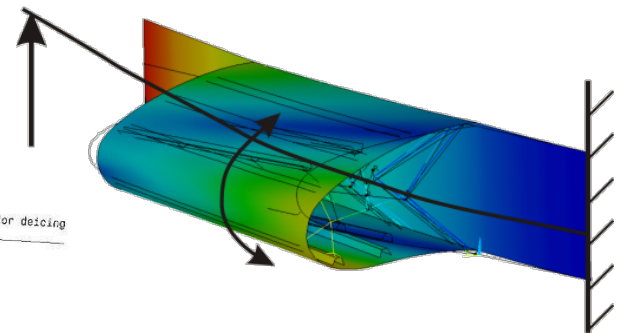
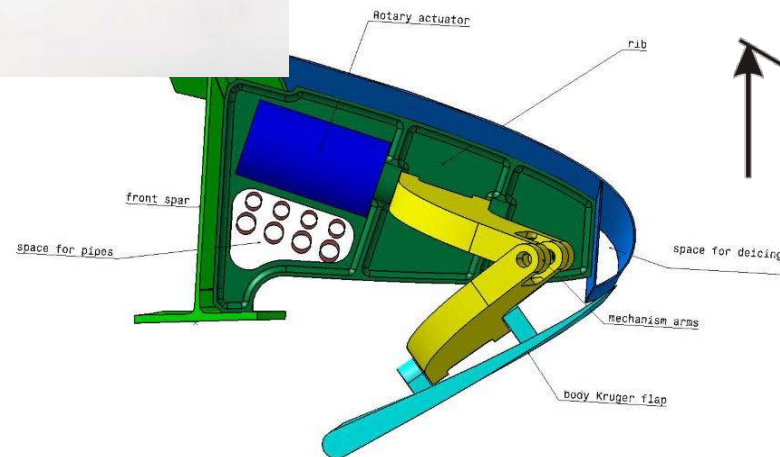
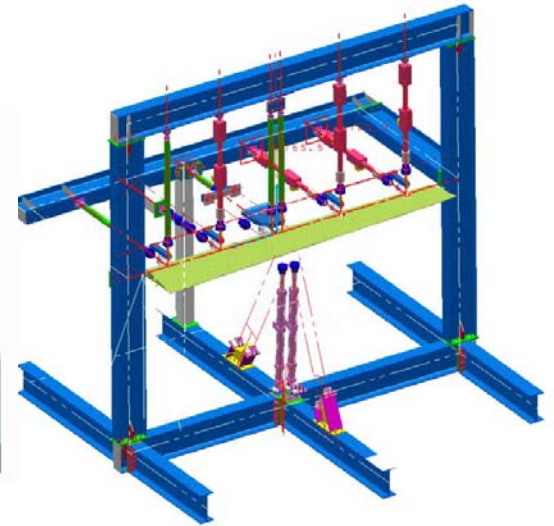
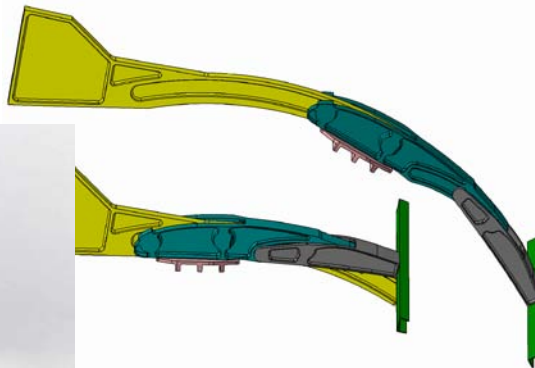
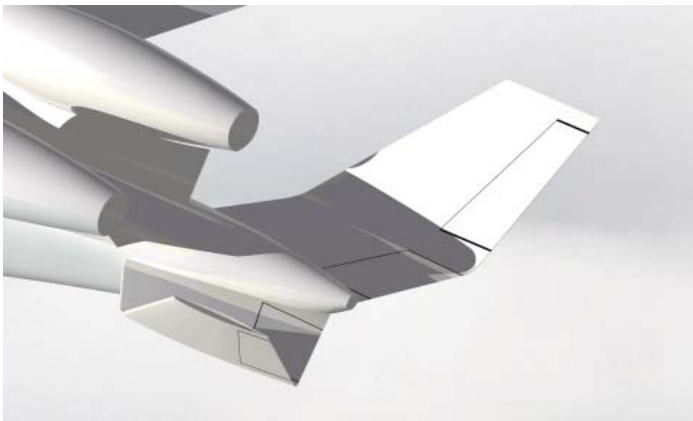
Following the process of selection of Associate Partners to the JTI “Clean Sky”, INCAS Consortium (INCAS, STRAERO, Avioane Craiova and ROMAERO) is part of the **SFWA** – Smart Fixed Wing Aircraft

➤ WP1 – WP112/114



SFWA participation – INCAS Cluster (cont.)

WP -2



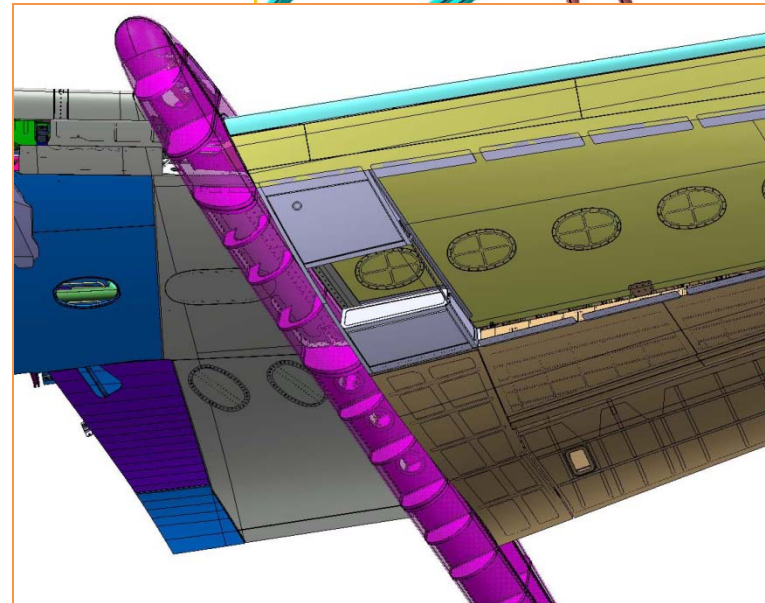
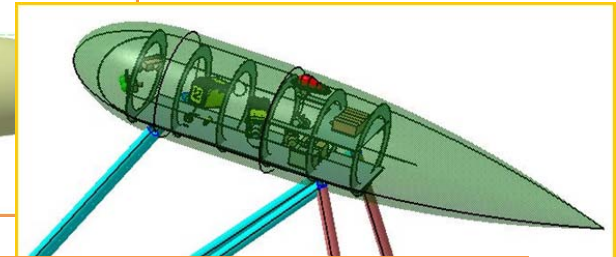
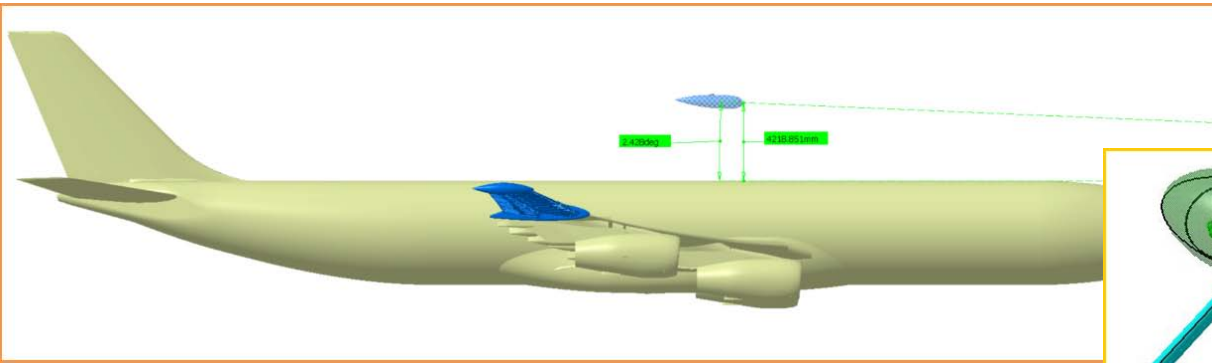
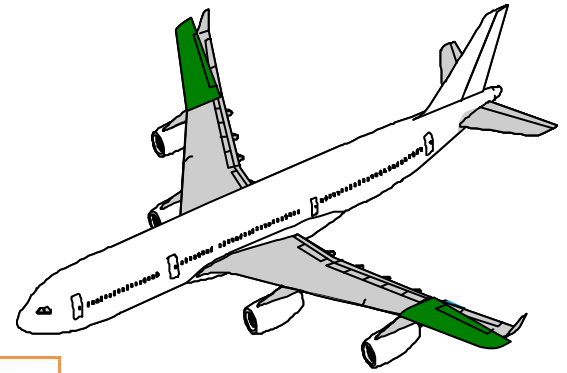
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## CS Participation

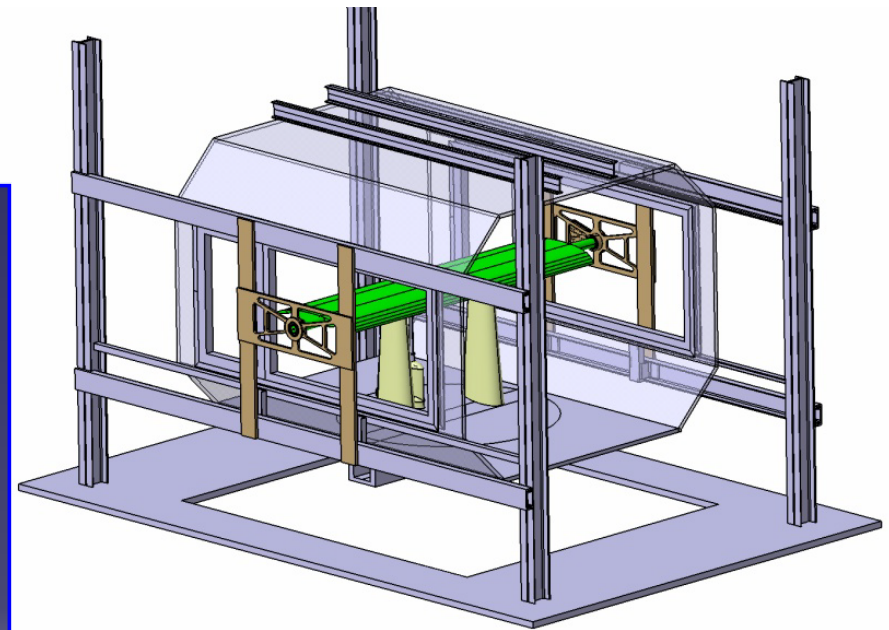
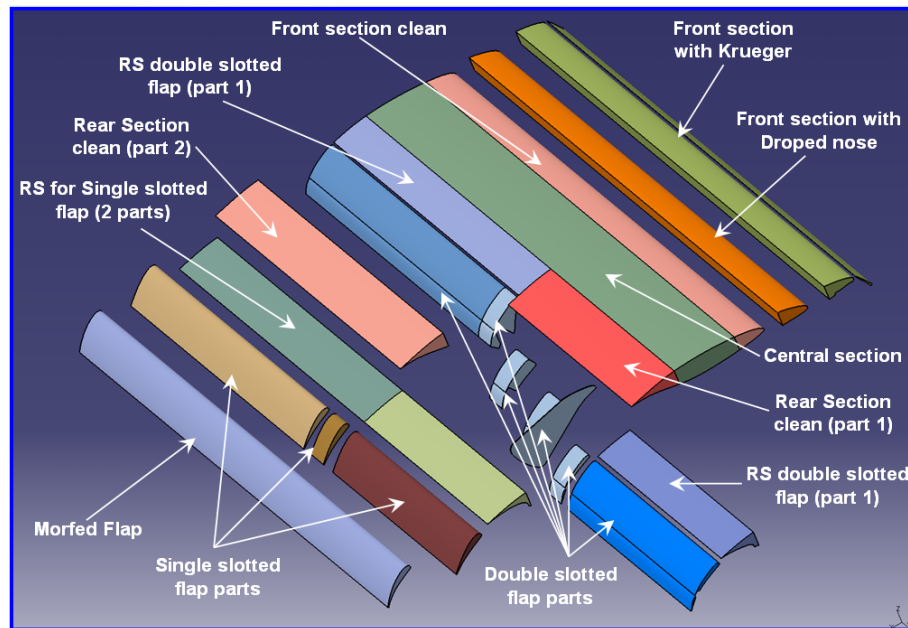
### SFWA participation – INCAS Cluster (cont.)

WP -3

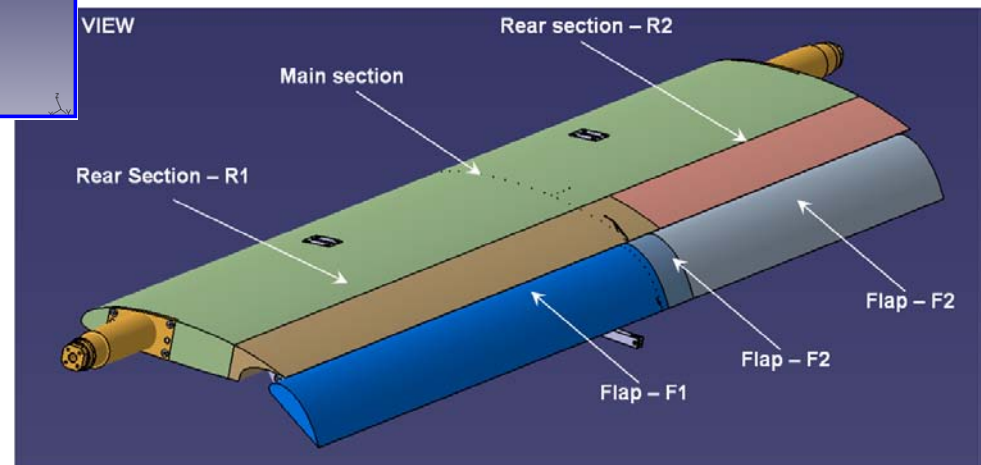


## CS Participation

### GRA participation – INCAS



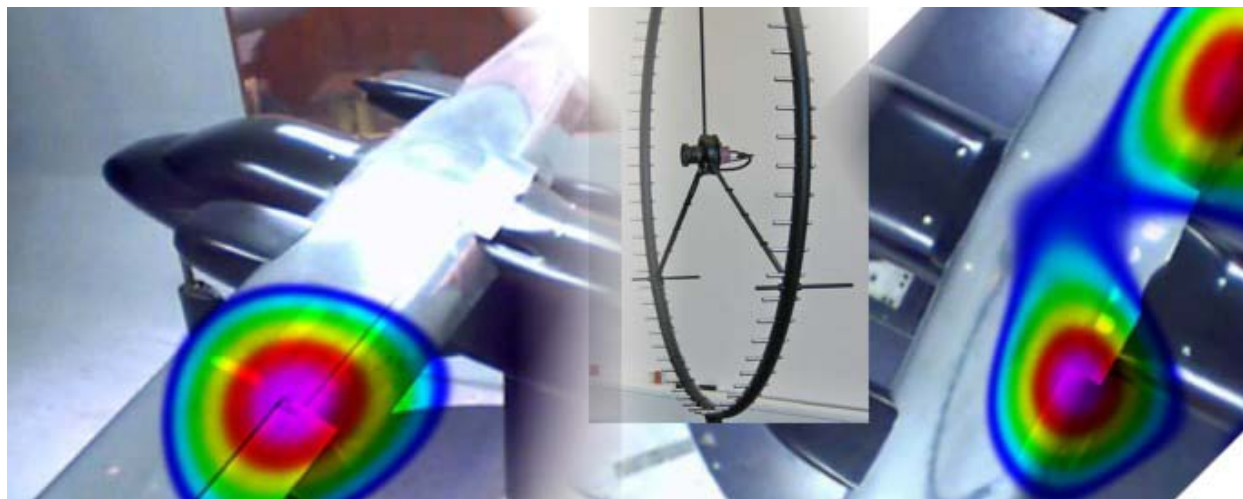
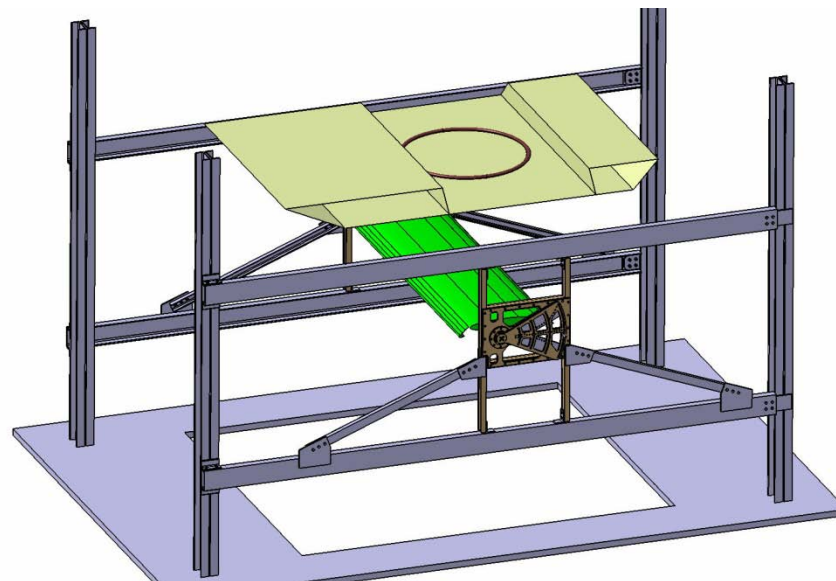
Following the process of selection of Associate Partners to the JTI “Clean Sky”, INCAS is a member of CIRA Plus Cluster in LowNoise wp of GRA



## CS Participation

### GRA participation – INCAS (cont.)

Aeroacoustic test - beamforming



## CS Participation

### Other ITDs ....

STRAERO – CfP for test rig in SGO – (in negotiation phase)

COMOTI – main interest in engines CfP

INCD – TP – consortium with INCAS in Eco-design

AEROSTAR Bacau – CfP in SFWA (rigs, oth.)

Other ....



## Enhancing Romanian participation to Clean Sky

Other planned potential participations in Clean Sky :

- Participation to SFWA - ITD and GRA - ITD – main focus for INCAS Cluster
- Enabling potential participation of Romanian partners using CfT/subcontracting
- Using CfP mechanism for enlarging Romanian participation:
  - - participation of INCAS cluster members in other ITDs
  - - participation of other Romanian entities in CfP for SAGE, SGO and EcoDesign
  - - joint partnerships/participation with external partners (CfP and CfT)



Thank you for your attention!